GOVERNMENT CENTER - BOSTON

Urban Renewal Project - Mass. R-35

CODE NO. R-224

Project Improvements Report

# PRELIMINARY COST ESTIMATES OF SPECIAL PROJECT IMPROVEMENTS



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CLARKESON

THE CLARKESON ENGINEERING COMPANY, INC.
285 COLUMBUS AVENUE, BOSTON 16, MASSACHUSETTS
COMMONWEALTH 6-7720

GOVERNMENT CENTER - BOSTON

Urban Renewal Project - Mass. R-35

CODE NO. R-224
Project Improvements Report

PRELIMINARY COST ESTIMATES OF
SPECIAL PROJECT IMPROVEMENTS

Prepared for: Boston Redevelopment Authority

By: I. M. Pei & Associates
Architects and Planners

Clarkeson Engineering Company, Inc.
Consulting Engineers

June 30, 1961

R-224 (Special)

GOVERNMENT CENTER - BOSTON

Urban Renewal Project - Mass. R-35

CODE NO. R-22A
Project Improvements Report

# PRELIMINARY COST ESTIMATES OF SPECIAL PROJECT IMPROVEMENTS

Prepared for: Boston Redevelopment Authority

By: I. M. Pei & Associates
Architects and Planners

Clarkeson Engineering Company, Inc.
Consulting Engineers

June 30, 1961

R-22A (Special)

CODE NO. R-224

Project Improvements Report

PRELIMINARY COST ESTIMATES OF
SPECIAL PROJECT IMPROVEMENTS

The following descriptions of the various special project improvements are those which were determined to be absolutely necessary, after thorough analysis in order to achieve the urban renewal objectives of the Government Center Project.

They reflect careful studies of existing facilities, the proposals and objectives of the Plan as well as the topographic and subsoil conditions within the project area.

The unit prices used are those which reflect in the opinion and experience of the consulting engineer, the most recent and often used figures by contractors in the locality for the same or similar work.

In summary form, the following table lists cost estimates for those special project improvements which were studied in detail.

CODE NO. R-224

Project Improvements Report

## PRELIMINARY COST ESTIMATES OF SPECIAL PROJECT IMPROVEMENTS

The following descriptions of the various special project improvements are those which were determined to be absolutely necessary, after thorough analysis in order to achieve the urban renewal objectives of the Government Center Project.

They reflect careful studies of existing facilities, the proposals and objectives of the Plan as well as the topographic and subsoil conditions within the project area.

The unit prices used are those which reflect in the opinion and experience of the consulting engineer, the most recent and often used figures by contractors in the locality for the same or similar work.

In summary form, the following table lists cost estimates for those special project improvements which were studied in detail.

## SUMMARY

| | |
|---|---|
| Underpass (New Congress Street) | $ 82,000.00 |
| Pedestrian Overpass (City Hall) | 546,000.00 |
| Government Center Common | 751,000.00 |
| Dock Square Plaza Area | 142,000.00 |
| Pemberton Square Grading | 82,000.00 |
| Subway Conversion to Concourse (Corn Hill) | 82,000.00 |
| Public Parking Garage | 6,142,000.00 |
| Central Artery Interchange Adjustments | 2,280,000.00 |
| Central Artery Adjustments (Interim Costs) | 6,000.00 |
| TOTAL | $ 10,113,000.00 |

## SUMMARY

| | |
|---|---|
| Underpass (New Congress Street) | $ 82,000.00 |
| Pedestrian Overpass (City Hall) | 546,000.00 |
| Government Center Common | 751,000.00 |
| Dock Square Plaza Area | 142,000.00 |
| Pemberton Square Grading | 82,000.00 |
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| Public Parking Garage | 6,142,000.00 |
| Central Artery Interchange Adjustments | 2,280,000.00 |
| Central Artery Adjustments (Interim Costs) | 6,000.00 |
| TOTAL | $ 10,113,000.00 |

UNDERPASS (NEW CONGRESS STREET)

| | | | |
|---|---|---|---|
| Underpass Grading-Excavation | 6,200 C.Y. @ $1.00 | = $6,200.00 | |
| **Underpass Lighting (See Sketch A )** | | | |
| 56 100 W Rapid Start Fluorescent Units with Ballast | @ $175.00 | $9,800.00 | |
| 56 100 W Rapid Start Fluorescent Units no Ballast | @ $150.00 | $8,400.00 | |
| 2600 L.F. #6 - 1/C Cable | @$165.00/1000' | $ 429.00 | |
| 50 L.F. 1-1/2" Conduit | @ $1.30 | $ 65.00 | |
| 150 L.F. 2" Conduit | @ $1.60 | $ 240.00 | |
| 2 Junction Boxes | @ $150.00 | $ 300.00 | |
| 1 Manhole @ $1500.00 (Use 1/2 of cost) | | $ 750.00 | |
| | | $19,984.00 | |
| | Use | | $20,000.00 |
| **Underpass Drainage (See Sketch B )** | | | |
| 11 Catch Basins | @ $200.00 | $2,200.00 | |
| 6 Manholes | @ $200.00 | $1,200.00 | |
| 400 L.F. 12" Reinforced Conc. Pipe | @ $ 12.00* | $4,800.00 | |
| 450 L.F. 15" Reinforced Conc. Pipe | @ $ 12.00* | $5,400.00 | |
| | | $13,600.00 | |
| | Use | | $14,000.00 |
| **Retaining Walls (See Sketch C )** | | | |
| Footing Concrete | 210 C.Y. @ $25.00 | $ 5,250.00 | |
| Stem Concrete | 270 C.Y. @ $60.00 | $16,200.00 | |
| Reinforcing Steel | 71,500 Lbs. @ $0.13 | $ 9,295.00 | |
| Excavation | 1500 C.Y. @ $ 2.00 | $ 3,000.00 | |
| | | $33,745.00 | |
| | Use | | $34,000.00 |
| GRAND TOTAL | | $ 74,200.00 | |
| 10% E & C | | 7,400.00 | |
| | | $ 81,600.00 | |
| | Use | | $ 82,000.00 |

* $12.00 represents average cost per linear foot - allowing for ground water and deep cut.

R-224 (Special)

UNDERPASS (10W CONCRETE STREET)

Underpass Grading-Excavation 6,200 C.Y. @ $1.00 = $6,200.00

Underpass Lighting (See Sketch A)

| | | | |
|---|---|---|---|
| 56 | 100 W Rapid Start Fluorescent Units with Ballast | @ $175.00 | $9,800.00 |
| 56 | 100 W Rapid Start Fluorescent Units no Ballast | @ $150.00 | $8,400.00 |
| 2600 L.F. #6 - 1/c Cable | | @$165.00/1000' | $ 429.00 |
| 50 L.F. 1-1/2" Conduit | | @ $1.30 | $ 65.00 |
| 150 L.F. 2" Conduit | | @ $1.60 | $ 240.00 |
| 2 Junction Boxes | | @ $150.00 | $ 300.00 |
| 1 Manhole @ $1500.00 (Use 1/2 of cost) | | | $ 750.00 |
| | | | $19,984.00 |
| | | Use | $20,000.00 |

Underpass Drainage (See Sketch B)

| | | | |
|---|---|---|---|
| 11 Catch Basins | | @ $200.00 | $2,200.00 |
| 6 Manholes | | @ $200.00 | $1,200.00 |
| 400 L.F. 12" Reinforced Conc. Pipe | | @ $ 12.00* | $4,800.00 |
| 450 L.F. 15" Reinforced Conc. Pipe | | @ $ 12.00* | $5,400.00 |
| | | | $13,600.00 |
| | | Use | $14,000.00 |

Retaining Walls (See Sketch C)

| | | | |
|---|---|---|---|
| Footing Concrete | 210 C.Y. | @ $25.00 | $ 5,250.00 |
| Stem Concrete | 270 C.Y. | @ $60.00 | $16,200.00 |
| Reinforcing Steel | 72,500 lbs. | @ $0.12 | $ 9,270.00 |
| Excavation | 1500 C.Y. | @ $ 2.00 | $ 3,000.00 |
| | | | $33,720.00 |
| | | Use | $34,000.00 |

| | | |
|---|---|---|
| GRAND TOTAL | | |
| 10% E & C | | $ 74,200.00 |
| | | 7,400.00 |
| | | $ 81,600.00 |
| | Use | $ 82,000.00 |

* $12.00 represents average cost per linear foot - allowing for ground water and deep cut.

R-22% (Special)

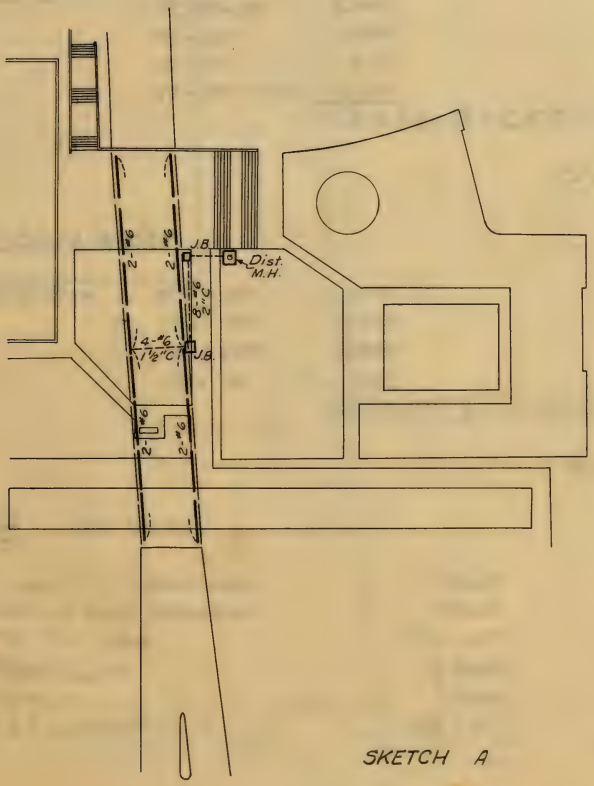
COMP. BY P.J.D.
CHECK BY F.E.K.
ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

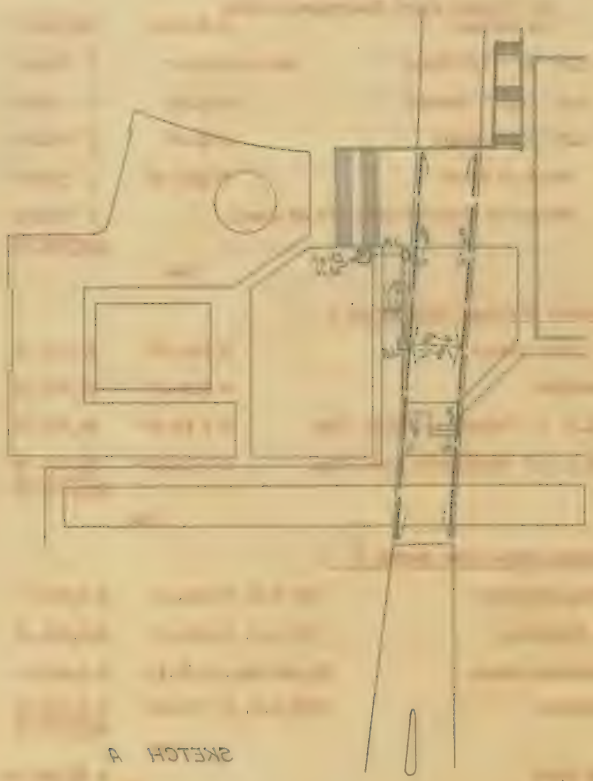
SHEET ____ OF ____
DATE ____
LOCATION ____

SUBJECT Underpass (New Congress Street)

Lighting




SKETCH A



COMP. BY J.P.W.
CHECK BY
ACTIV. NO.

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE 6-24-61
LOCATION

SUBJECT Pedestrian Overpass (City Hall)

## Cobblestone Paving

| | | | |
|---|---|---|---|
| Surface Area | 50' × 135' | = | 6,750 S.F. |
| | $\frac{80+135}{2} \times 50$ | = | 5,375 |
| | $\frac{70+125}{2} \times 55$ | = | 5,362 |
| | 30 × 125 | = | 3,750 |
| | 15 × 25 | = | 375 |
| | 25 × 40 | = | 1,000 |
| | | | 22,612 S.F. × $\frac{1}{9}$ = 2,512 S.Y. |

Say 2,750 S.Y.

## Granite Block Walks

| | | | |
|---|---|---|---|
| Surface Area | 85' × 135' | = | 11,475 S.F. |
| | 15 × 190 | = | 2,850 |
| | 10 × 425 | = | 4,250 |
| | 25 × 30 | = | 750 |
| | | | 19,325 S.F. × $\frac{1}{9}$ = 2,147 S.Y. |

Say 2,250 S.Y.

## Lighting (See Sketch)

| | |
|---|---|
| Single Unit Standards | 8 Each |
| Multiple Unit Standards | 2 Each |
| #4 - 2/c Cable | 1,800 L.F. |
| Photo Cells | 2 Each |
| Relays | 2 Each |
| 1½" Conduit | 500 L.F. |

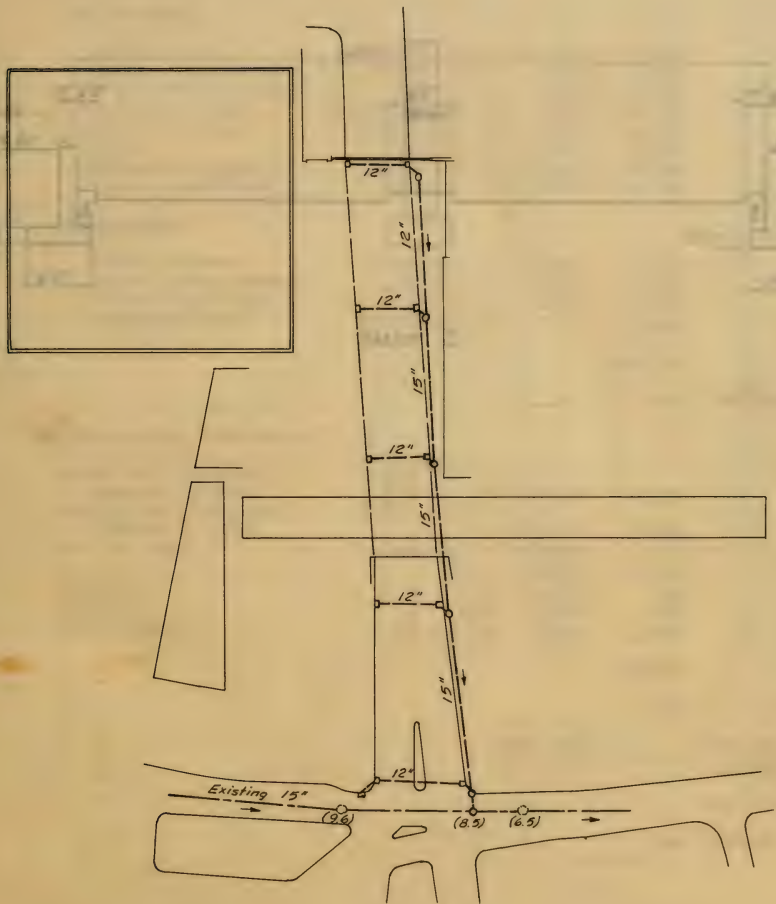
COMP. BY P.J.D.
CHECK BY S.P.M.
ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

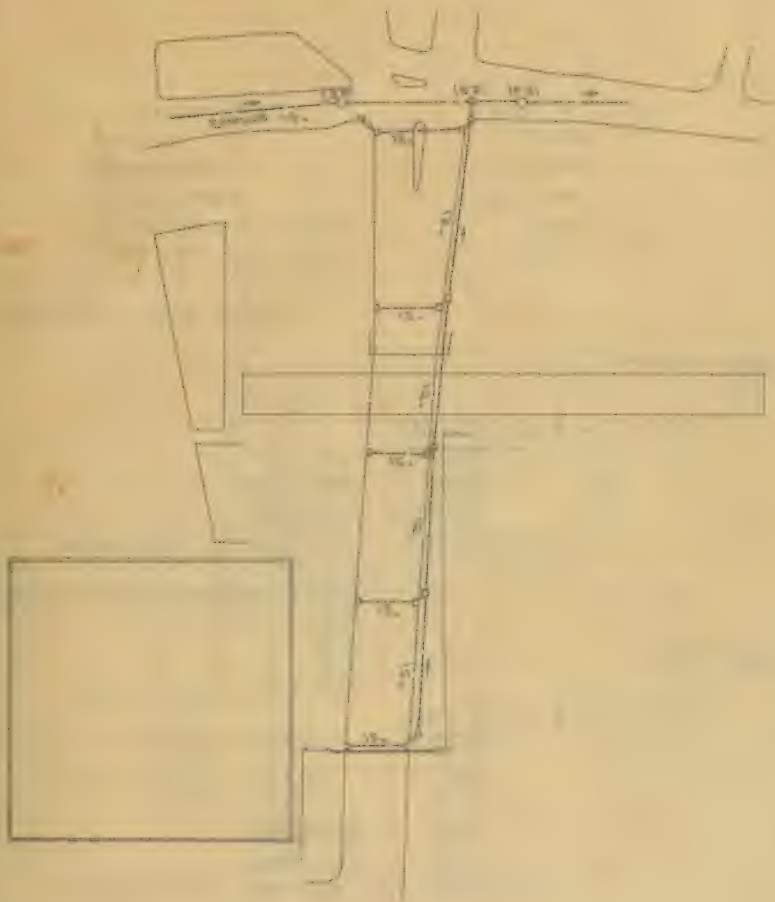
SHEET ____ OF ____
DATE ____
LOCATION ____

SUBJECT Underpass (New Congress Street)

Drainage




SKETCH B



SWITCH 3

SUBJECT: THOMPSON TUBE COMPANY PLANT

YOUR NO. 19

CHECK BY: E.S.W.

TOTAL BY: S.T.D.

CRAWFORD ENGINEERING CO., INC.

FOLDER

DATE

SHEET OF

COMP. BY

CHECK BY

ACTIV. NO.

CLARKESON ENGINEERING CO., INC.

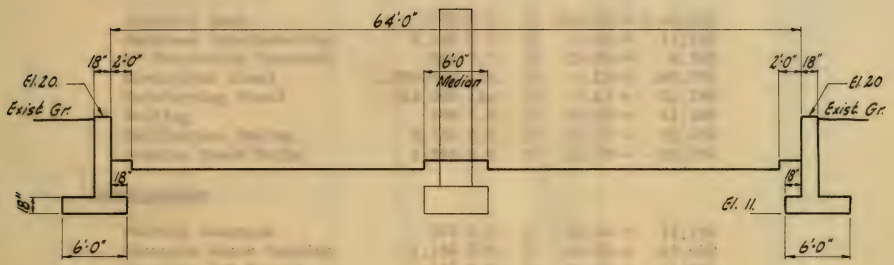
ENGINEERS

SHEET OF

DATE 29 Jun 61

LOCATION

SUBJECT Underpass (New Congress Street)




Sketch C

COMP. BY _____
CHECK BY _____
ACCTN. NO. _____

CLARKSON ENGINEERING CO., INC.
CONSULTING

SHEET _____ OF _____
DATE _____
LOCATION _____

SUBJECT Underdrain (Lake Canyon Sewer)

## PEDESTRIAN OVERPASS (CITY HALL)

### Overpass Structure (See Sketch D )

#### Superstructure

| | | | | | |
|---|---|---|---|---|---|
| Concrete Deck | 770 C.Y. | @ | $60.00 = | $ 46,200 |
| Membrane Waterproofing | 4,700 S.Y. | @ | 2.50 = | 11,750 |
| 2" Protective Concrete | 260 C.Y. | @ | 25.00 = | 6,500 |
| Structural Steel | 1,200,000 Lbs. | @ | 0.15 = | 180,000 |
| Reinforcing Steel | 263,000 Lbs. | @ | 0.13 = | 34,190 |
| Railing | 700 L.F. | @ | 16.00 = | 11,200 |
| Cobblestone Paving | 2,750 S.Y. | @ | 12.00 = | 33,000 |
| Granite Block Walks | 2,250 S.Y. | @ | 15.00 = | 33,750 |

#### Substructure

| | | | | |
|---|---|---|---|---|
| Footing Concrete | 510 C.Y. | @ | 25.00 = | 12,750 |
| Concrete above Footing | 1,150 C.Y. | @ | 60.00 = | 69,000 |
| Concrete for Stairs | 150 C.Y. | @ | 75.00 = | 11,250 |
| Reinforcing Steel | 258,000 Lbs. | @ | 0.13 = | 33,540 |
| | | | | $484,130 |

Use: $485,000

### Overpass Lighting (See Sketch E )

| | | | | |
|---|---|---|---|---|
| Single Unit Standards, Complete in Place | 8 | @ | 500.00 = | 4,000 |
| Multiple Unit Standards, Complete in Place | 2 | @ | 2500.00 = | 5,000 |
| #4 - 2/C Cable | 1,800 L.F. | @ | 709.00/ 1000' = | 1,276 |
| Photocells | 2 | @ | 25.00 = | 50 |
| Relays | 2 | @ | 60.00 = | 120 |
| 1-1/2" Conduit | 500 L.F. | @ | 1.30 = | 650 |
| | | | | $11,096 |

Use: $ 11,100

| | |
|---|---|
| GRAND TOTAL | $496,100 |
| 10% E. & C. | 49,610 |
| | $545,710 |

Use: $546,000

## PEDESTRIAN OVERPASS (CITY HALL)

### Overpass Structure (See Sketch D )

#### Superstructure

| | | | | |
|---|---|---|---|---|
| Concrete Deck | 770 C.Y. | @ | $60.00 = | $ 46,200 |
| Maintenance Waterproofing | 4,700 S.Y. | @ | 2.50 = | 11,750 |
| 3" Protective Concrete | 300 C.Y. | @ | 25.00 = | 6,500 |
| Structural Steel | 1,100,000 lbs. | @ | 0.15 = | 180,000 |
| Reinforcing Steel | 265,000 lbs. | @ | 0.13 = | 34,190 |
| Railing | 700 L.F. | @ | 16.00 = | 11,200 |
| Cobblestone Paving | 3,750 S.Y. | @ | 12.00 = | 33,000 |
| Granite Block Walks | 2,250 S.Y. | @ | 15.00 = | 33,750 |

#### Substructure

| | | | | |
|---|---|---|---|---|
| Footing Concrete | 510 C.Y. | @ | 25.00 = | 12,750 |
| Concrete above Footing | 1,150 C.Y. | @ | 60.00 = | 69,000 |
| Concrete for Seats | 150 C.Y. | @ | 75.00 = | 11,250 |
| Reinforcing Steel | 258,000 lbs. | @ | 0.13 = | 33,540 |
| | | | | $464,130 |

Use: $485,000

### Overpass Lighting (See Sketch E )

| | | | | |
|---|---|---|---|---|
| Single Unit Standards, Complete in Place | 8 | @ | 500.00 = | 4,000 |
| Multiple Unit Standards, Complete in Place | 2 | @ | 2500.00 = | 5,000 |
| 4x - 3/C Cable | 1,800 L.F. | @ | 709.00/ 1000' = | 1,276 |
| Receptacle | 2 | @ | 25.00 = | 50 |
| Relays | 2 | @ | 60.00 = | 120 |
| 1-1/2" Conduit | 500 L.F. | @ | 1.30 = | 650 |
| | | | | $11,096 |

Use: $ 11,100

| | |
|---|---|
| GRAND TOTAL | $496,100 |
| 10% E. & C. | 49,610 |
| | $545,710 |

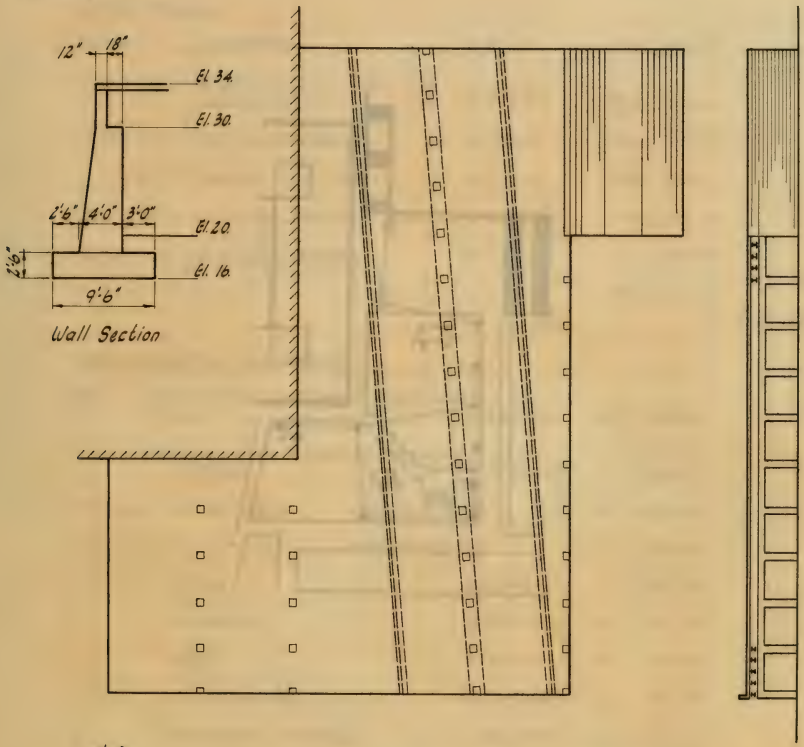
Use: $546,000

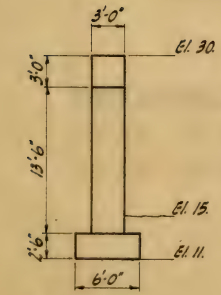
COMP. BY_____
CHECK BY_____
ACTIV. NO._____

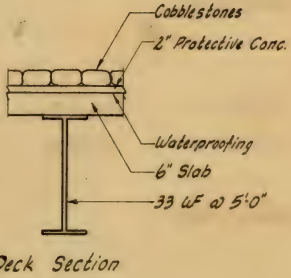
**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET_____ OF_____
DATE 29 Jun 61
LOCATION_____

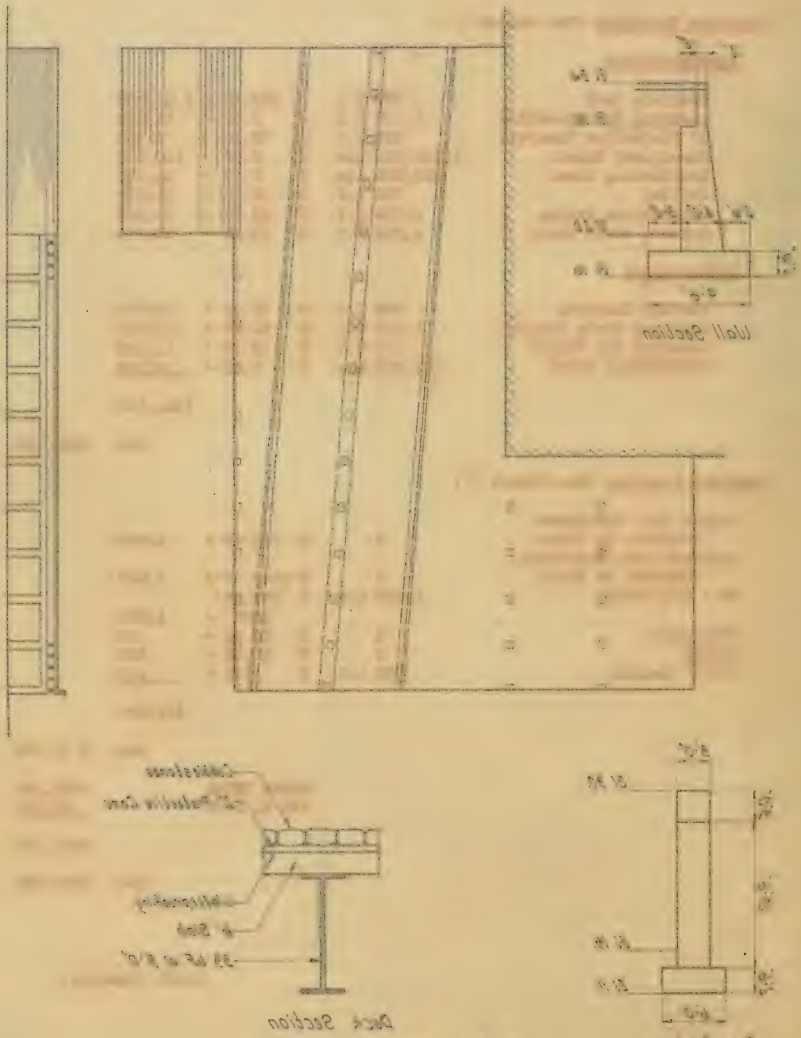
SUBJECT *Pedestrian Overpass (City Hall)*




Sketch D


Wall Section
Deck Section
Pier Section

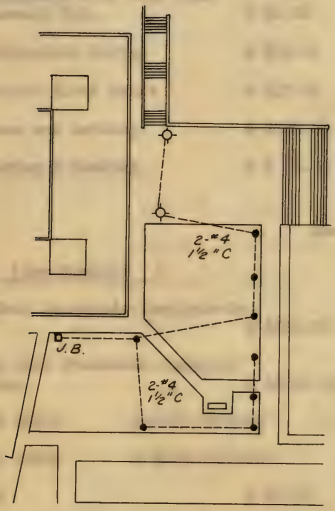
COMP. BY P.J.D.
CHECK BY F.E.K.
ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE ____
LOCATION ____

SUBJECT Pedestrian Overpass (City Hall)

Lighting




SKETCH E

SKETCH 3

SUBJECT: [illegible]

YEAR NO. 1981

CHECK NO. [illegible]

CONT. NO. 6110

CYNKOSKI ENGINEERING CO. INC.

FOLDER

DATE

SHEET

GOVERNMENT CENTER COMMON

Common Grading

| | | | | |
|---|---|---|---|---|
| 46,500 C.Y. | Embankment | @ $1.00 | $ 46,500.00 | |
| 10,800 C.Y. | Embankment over City Hall Basement Ext. | @ $1.00 | $ 10,800.00 | |
| 20,500 S.Y. | Cobblestone Paving | @ $12.00 | $246,000.00 | |
| 9,500 S.Y. | Granite Block Walks | @ $15.00 | $142,500.00 | |
| 85 Each | Trees and Setting | @ $500.00 | $ 42,500.00 | |
| 6,900 S.Y. | Loaming & Seeding | @ $ 0.50 | $ 3,450.00 | |
| | | | $491,750.00 | |
| | | Use | | $492,000.00 |

Common Lighting (See Sketch F )

| | | | | |
|---|---|---|---|---|
| 42 | Single Unit Standards-Complete-in-Place | @ $500.00 | $ 21,000.00 | |
| 2 | Multiple Unit Standards-Complete-in-Place | @ $2500.00 | $ 5,000.00 | |
| 3800 L.F. | #4 2/C Cable | @ $709.00/1000' | $ 2,694.20 | |
| 2000 L.F. | #6 2/C Cable | @ $642.00/1000' | $ 1,284.00 | |
| 6000 L.F. | Trench | @ $0.25 | $ 1,500.00 | |
| 7 | Photocells | @ $25.00 | $ 175.00 | |
| 7 | Relays | @ $60.00 | $ 420.00 | |
| 2 | Junction Boxes | @ $150.00 | $ 300.00 | |
| 1 | Distribution Manhole | @ $1500.00 | $ 1,500.00 | |
| | | | $ 33,873.20 | |
| | | Use | | $34,000.00 |

Common Drainage (See Sketch G )

| | | | | |
|---|---|---|---|---|
| 1650 L.F. | 12" Reinf. Conc. Pipe | @ $4.00 | $ 6,600.00 | |
| 150 L.F. | 15" Reinf. Conc. Pipe | @ $4.50 | $ 675.00 | |

### Common Grading

| | | | |
|---|---|---|---|
| 4,100 C.Y. | Excavation | @ $2.00 | $ 8,200.00 |
| 10,600 C.Y. | Excavation over City Hall Basement Est. | @ $2.00 | $ 10,800.00 |
| 10,300 S.Y. | Cultivateover Paving | @ $2.00 | $20,600.00 |
| 7,300 S.Y. | Grade Block Walks | @ $2.00 | $12,500.00 |
| 85 | Each Trees and Setting | @ $500.00 | $ 42,500.00 |
| 6,900 S.Y. | Loading & Hauling | @ $ 0.50 | $ 3,450.00 |
| | | | $121,750.00 |

Use $192,000.00

### Common Lighting (See Sheet 7 )

| | | | |
|---|---|---|---|
| 42 | Single Unit Standard-Complete-in-Place | @ $500.00 | $ 21,000.00 |
| 2 | Multiple Unit Standard-Complete-in-Place | @ $2500.00 | $ 5,000.00 |
| 3600 L.F. | #4 S/C Cable | @ $[illegible].00/1000' | $ 2,664.00 |
| 2000 L.F. | #6 S/C Cable | @ $[illegible].00/1000' | $ 1,284.00 |
| 6000 L.F. | Trench | @ $0.25 | $ 1,500.00 |
| 7 | Manholes | @ $25.00 | $ 175.00 |
| 7 | Relays | @ $80.00 | $ 560.00 |
| 2 | Junction Boxes | @ $150.00 | $ 300.00 |
| 1 | Distribution Kandala | @ $1,500.00 | $ 1,500.00 |
| | | | $ 32,973.00 |

Use $34,000.00

### Common Drainage (See Sheet 6 )

| | | | |
|---|---|---|---|
| 1650 L.F. | 12" Reinf. Conc. Pipe | @ $4.00 | $ 6,600.00 |
| 150 L.F. | 15" Reinf. Conc. Pipe | @ $4.50 | $ 675.00 |

| | | | |
|---|---|---|---|
| 625 L.F. 18" Reinf. Conc. Pipe | @ $5.50 | $ 3,437.50 | |
| 450 L.F. 24" Reinf. Conc. Pipe | @ $8.00 | $ 3,600.00 | |
| 40 Inlets | @ $200.00 | $ 8,000.00 | |
| 10 Manholes | @ $250.00 | $ 2,500.00 | |
| 1100 L.F. 10" Sub-drain | @ $4.50 | $ 4,950.00 | |
| 900 L.F. Grating | @ $4.00 | $ 3,600.00 | |
| | | $33,362.50 | |
| | Use | | $33,500.00 |

Retaining Wall (See Sketch H )

| | | | | |
|---|---|---|---|---|
| Footing Concrete | 720 C.Y. | @ $25.00 | $18,000.00 | |
| Stem Concrete | 1020 C.Y. | @ $60.00 | $61,200.00 | |
| Reinforcing Steel | 261,000 Lbs. | @$0.13 | $33,930.00 | |
| Excavation | 2100 C.Y. | @ $2.00 | $ 4,200.00 | |
| Sheeting | | | $ 5,000.00 | |
| | | | $122,330.00 | |
| | | Use | | $123,000.00 |

| | | |
|---|---|---|
| GRAND TOTAL | $ 682,500.00 | |
| +10% E & C | 68,250.00 | |
| | 750,750.00 | |
| Use | | $751,000.00 |

| | | | |
|---|---|---|---|
| 625 L.F. 10" Galvl. Conc. Pipe | @ $5.50 | | $ 3,437.50 |
| 450 L.F. 24" Galvl. Conc. Pipe | @ $8.00 | | $ 3,600.00 |
| 40 Inlets | @ $200.00 | | $ 8,000.00 |
| 10 Manholes | @ $250.00 | | $ 2,500.00 |
| 1100 L.F. 10" sub-drain | @ $4.50 | | $ 4,950.00 |
| 500 L.F. Grading | @ $6.00 | | $ 3,000.00 |
| | | | $33,362.50 |
| | | Use | $33,500.00 |

Retaining Wall (See Sheet 8 )

| | | | |
|---|---|---|---|
| Footing Concrete | 730 C.Y. | @ $25.00 | $18,000.00 |
| Stem Concrete | 1030 C.Y. | @ $60.00 | $61,200.00 |
| Reinforcing Steel | 285,000 lbs. | @$0.13 | 133,250.00 |
| Excavation | 2100 C.Y. | @ $2.00 | $ 4,200.00 |
| Jacking | | | $ 5,000.00 |
| | | | $221,330.00 |
| | | Use | $223,000.00 |

| | | |
|---|---|---|
| GRAND TOTAL | | $ 625,500.00 |
| +10% S & C | | 62,250.00 |
| | | 750,750.00 |
| | Use | $751,000.00 |

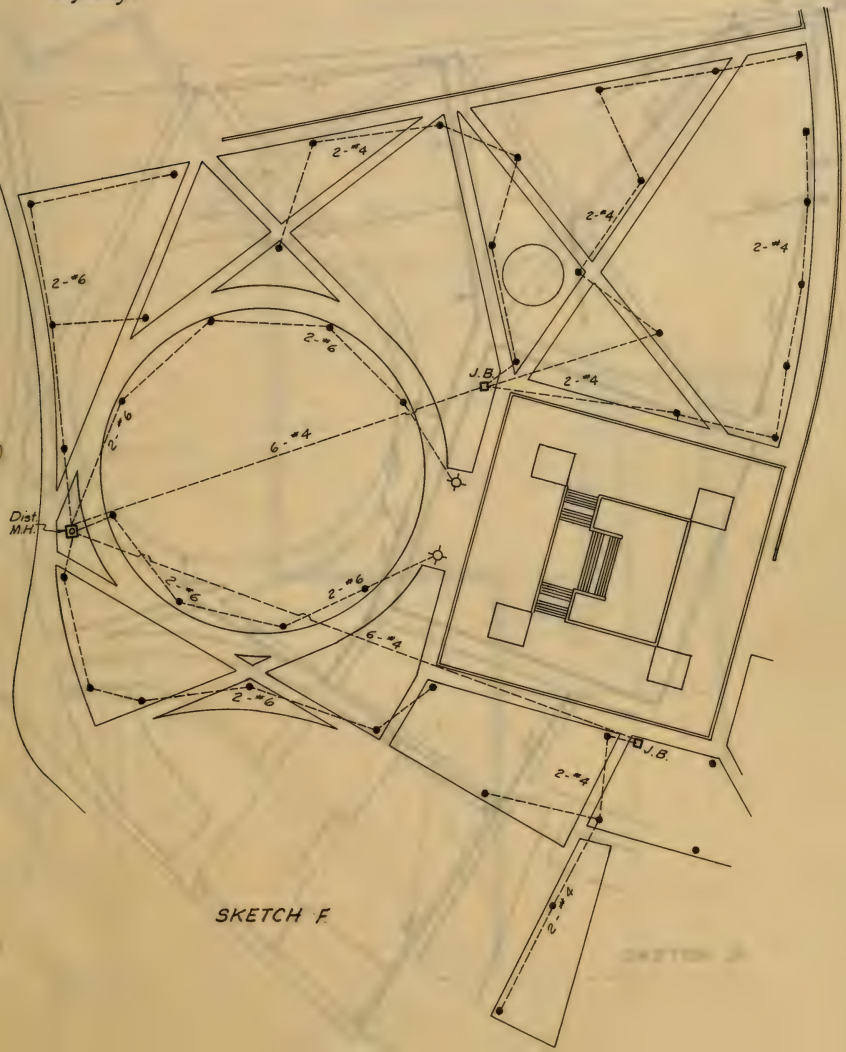
COMP. BY P.J.D.
CHECK BY F.E.K.
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE ____
LOCATION ____

SUBJECT *Government Center Common*

*Lighting*




SKETCH F

COMP. BY P.J.D.
CHECK BY S.P.M.
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE ____
LOCATION ____

SUBJECT *Government Center Common*

*Drainage*


SKETCH G

DRAWN BY R.L.D.
CHECKED BY S.C.H.
WORK NO. 181
SUBJECT Conservatory Center Extension
CLARKSON ENGINEERING CO. INC.
DATE
LOCATION

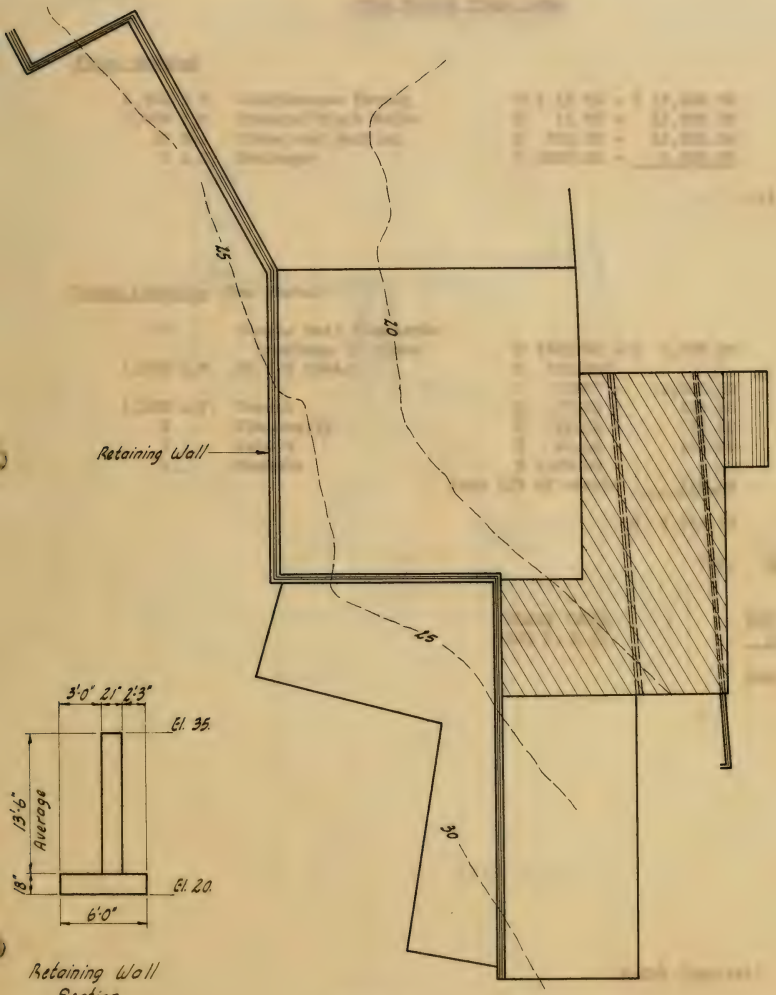
SKETCH 6

COMP. BY_____
CHECK BY_____
ACTIV. NO._____

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET_____OF_____
DATE 29 Jun 61
LOCATION_____

SUBJECT *Government Center Common*




Retaining Wall Section

Sketch H

## DOCK SQUARE PLAZA AREA

### Plaza Grading

| | | | | |
|---|---|---|---|---|
| 6,500 S.Y. | Cobblestone Paving | @ $ 12.00 = | $ 78,000.00 | |
| 1,400 S.Y. | Granite Block Walks | @ 15.00 = | 21,000.00 | |
| 30 Ea. | Trees and Setting | @ 500.00 = | 15,000.00 | |
| 1 L.S. | Drainage | @ 5000.00 = | 5,000.00 | |
| | | | | $119,000.00 |

### Plaza Lighting (See Sketch J )

| | | | | |
|---|---|---|---|---|
| 15 | Single Unit Standards - Complete in Place | @ $500.00 = | $ 7,500.00 | |
| 1,500 L.F. | #6 2/C Cable | @ 709.00/ 1000' = | 1,063.50 | |
| 1,500 L.F. | Trench | @ 0.25 = | 375.00 | |
| 3 | Photocells | @ 25.00 = | 75.00 | |
| 3 | Relays | @ 60.00 = | 180.00 | |
| 1 | Manhole | @ 1500.00 (use 1/2 of cost)= | 750.00 | |
| | | | $ 9,943.50 | |
| | | | Use: | 10,000.00 |

| | |
|---|---|
| GRAND TOTAL | $129,000.00 |
| 10% E. & C. | 13,000.00 |
| | $142,000.00 |

## DOCK SQUARE PLAZA AREA

### Plaza Grading

| | | | |
|---|---|---|---|
| 6,500 S.Y. | Cobblestone Paving | @ $ 12.00 = | $ 78,000.00 |
| 1,400 S.Y. | Granite Block Walks | @ 15.00 = | 21,000.00 |
| 30 Ea. | Trees and Setting | @ 500.00 = | 15,000.00 |
| 1 L.S. | Drainage | @ 5000.00 = | 5,000.00 |
| | | | $119,000.00 |

### Plaza Lighting (See Sketch 1 )

| | | | |
|---|---|---|---|
| 15 | Single Unit Standards - Complete in Place | @ $500.00 = | $ 7,500.00 |
| 1,500 L.F. | #6 2/C Cable | @ 705.00\ 1000' = | 1,043.50 |
| 1,500 L.F. | Trench | @ 0.25 = | 375.00 |
| 5 | Photocells | @ 25.00 = | 75.00 |
| 3 | Relays | @ 60.00 = | 180.00 |
| 1 | Transfo | @ 1500.00 (use 1/2 of cost)= | 750.00 |
| | | | $ 9,943.50 |

Use: 10,000.00

| | | |
|---|---|---|
| | GRAND TOTAL | $129,000.00 |
| | 10% E. & C. | 13,000.00 |
| | | $142,000.00 |

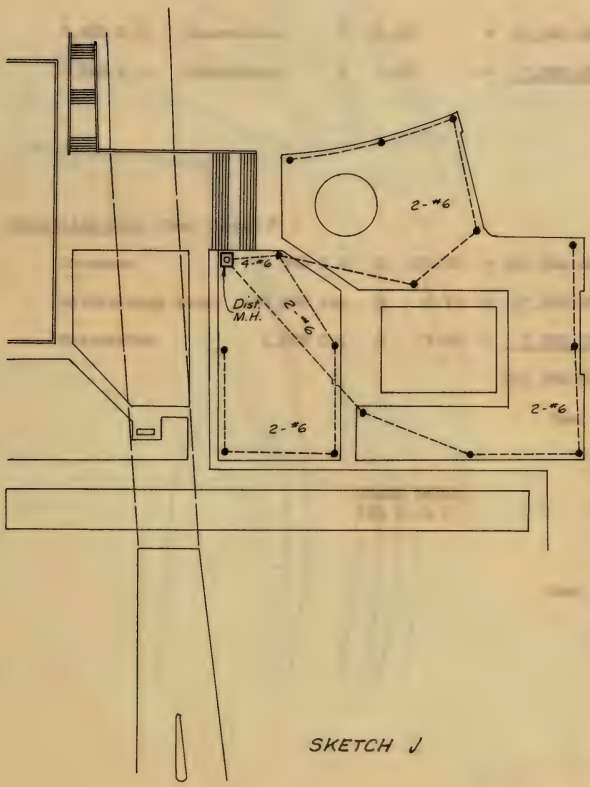
COMP. BY P.J.D.
CHECK BY F.E.K.
ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE ____
LOCATION ____

SUBJECT Dock Square Plaza Area

Lighting




SKETCH J

## PEMBERTON SQUARE GRADING

| | | | | | |
|---|---|---|---|---|---|
| 2,900 C.Y. | Excavation | @ $1.00 | = $2,900.00 | | |
| 5,200 C.Y. | Embankment | @ 1.00 | = 5,200.00 | | |
| | | | | | $8,100.00 |

**Retaining Wall** (See Sketch K )

| | | | | |
|---|---|---|---|---|
| Concrete | 900 C.Y. | @ $50.00 | = $45,000.00 | |
| Reinforcing Steel | 135,000 Lbs. | @ 0.13 | = 17,550.00 | |
| Excavation | 1,600 C.Y. | @ 2.00 | = 3,200.00 | |
| | | | $65,750.00 | |
| | | | Use: | $66,000.00 |

| | |
|---|---|
| GRAND TOTAL | $74,100.00 |
| 10% E. & C. | 7,410.00 |
| | $81,510.00 |
| Use: | $82,000.00 |

## FOUNDATION SQUARE CHARTING

| | | | | |
|---|---|---|---|---|
| 2,800 C.Y. | Excavation | @ $1.00 | = | $2,800.00 |
| 5,200 C.Y. | Embankment | @ 1.00 | = | 5,200.00 |
| | | | | $8,100.00 |

**Building Unit** (See Sheet 6 )

| | | | | |
|---|---|---|---|---|
| Concrete | 700 C.Y. | @ $50.00 | = | $45,000.00 |
| Reinforcing Steel | 135,000 lbs. | @ 0.13 | = | 17,550.00 |
| Excavation | 1,000 C.Y. | @ 2.00 | = | 2,200.00 |
| | | | | $65,750.00 |

Use: 66,000.00

| | |
|---|---|
| GRAND TOTAL | $74,100.00 |
| 10% E. & C. | 7,410.00 |
| | $81,510.00 |

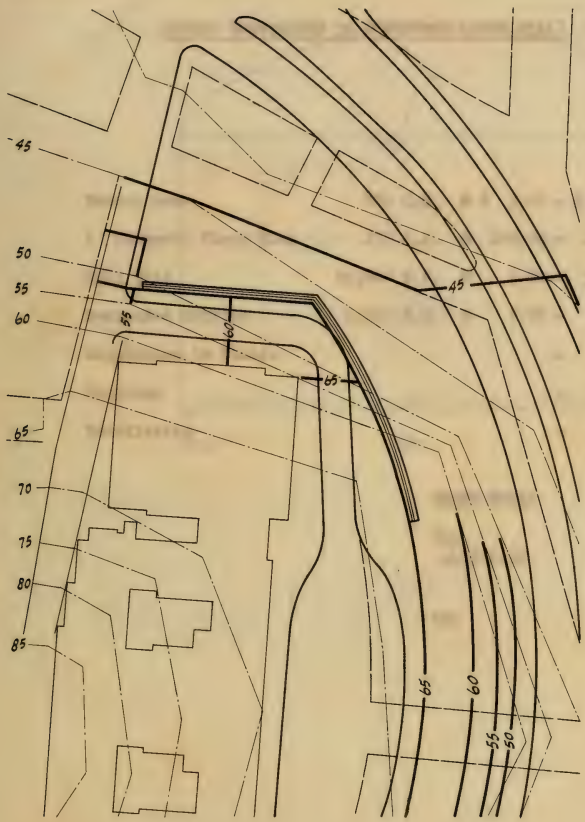
Use: $82,000.00

COMP. BY_____
CHECK BY_____
ACTIV. NO._____

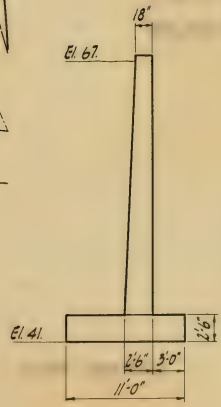
**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET_____OF_____
DATE 28 Nov 21
LOCATION_____

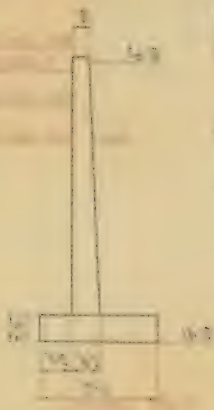
SUBJECT *Pemberton Square Grading*




*Sketch K*




*Retaining Wall Section*



SUBWAY CONVERSION TO CONCOURSE (CORN HILL) (See Sketch L )

| | | | | | |
|---|---|---|---|---|---|
| Gravel Base | 800 C.Y. | @ | $ 3.00 | = | $ 2,400.00 |
| 4" Concrete Floor Slab | 135 C.Y. | @ | 100.00 | = | 13,500.00 |
| Wall Tile | 10,800 S.F. | @ | 3.00 | = | 32,400.00 |
| Suspended Ceiling | 1,200 S.Y. | @ | 7.00 | = | 8,400.00 |
| Alteration to Stairs | | | | = | 5,000.00 |
| Lighting | | | | = | 7,000.00 |
| Ventilating | | | | = | 5,000.00 |

| | |
|---|---|
| GRAND TOTAL | $73,700.00 |
| Use | $74,000.00 |
| +10% E &C | 7,400.00 |
| | $81,400.00 |
| Use | $82,000.00 |

R-224 (Special)

SUMMARY CONVERSION TO COMMODORES (COMM MTG.) (See Sketch I )

| | | | |
|---|---|---|---|
| Gravel Base | 600 C.Y. @ $ 3.00 | = | $ 2,400.00 |
| 4" Concrete Floor Slab | 137 C.Y. @ 100.00 | = | 13,500.00 |
| Wall Tile | 10,000 S.F. @ 3.00 | = | 32,400.00 |
| Suspended Ceiling | 1,200 S.F. @ 7.00 | = | 8,400.00 |
| Alterations to Stairs | | = | 5,000.00 |
| Lighting | | = | 7,000.00 |
| Ventilation | | = | 5,000.00 |
| GRAND TOTAL | | | $73,700.00 |

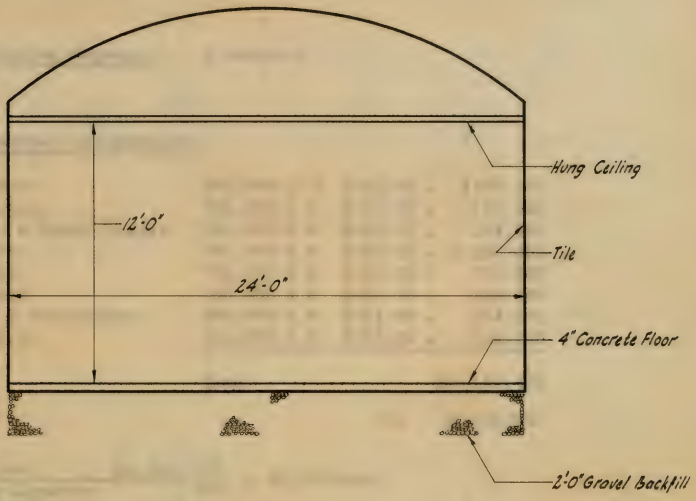
| | |
|---|---|
| Use | $74,000.00 |
| -10% @ 90 | 7,400.00 |
| | 82,400.00 |
| Use | $82,000.00 |

COMP. BY_____
CHECK BY_____
ACTIV. NO._____

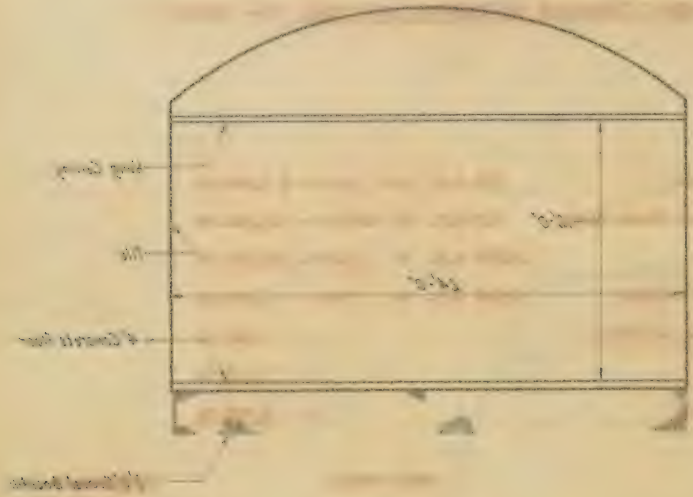
CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET_____OF_____
DATE 29 Jun 61
LOCATION_____

SUBJECT Subway Conversion to Concourse (Corn Hill)




Sketch L



PUBLIC PARKING GARAGE (See Sketch M)

Total Parking Capacity: 1,984 cars

Construction Cost Estimate:

| | | | |
|---|---|---|---|
| Excavation: | 100,630 C.Y. | @ $1.00 = | $100,630 |
| Foundations: | 756,000 S.F. | @ $0.25 = | 189,000 |
| Masonry & Other Trades: | 756,000 S.F. | @ $0.21 = | 164,000 |
| Structure: | 756,000 S.F. | @ $6.00 = | 4,536,000 |
| Plumbing: | 756,000 S.F. | @ $0.50 = | 378,000 |
| Electrical: | 756,000 S.F. | @ $0.50 = | 378,000 |
| Heating & Ventilation: | 264,000 S.F. | @ $1.00 = | 264,000 |
| Sprinklers: | 264,000 S.F. | @ $0.50 = | 132,000 |
| | Total | | $6,141,630 |
| | | Use | $6,142,000 |

$$\frac{\text{Total Cost: } \$6,141,630}{\text{Parking Capacity: } 1,984} = \$3,096/\text{car}$$

$$\frac{\text{Gross Floor Area: } 756,000 \text{ sq. ft.}}{\text{Parking Capacity: } 1,984} = 381 \text{ gross sq. ft./car}$$

## PUBLIC PARKING GARAGE (See Sketch M)

**Total Parking Capacity:** 1,984 cars

**Construction Cost Estimate:**

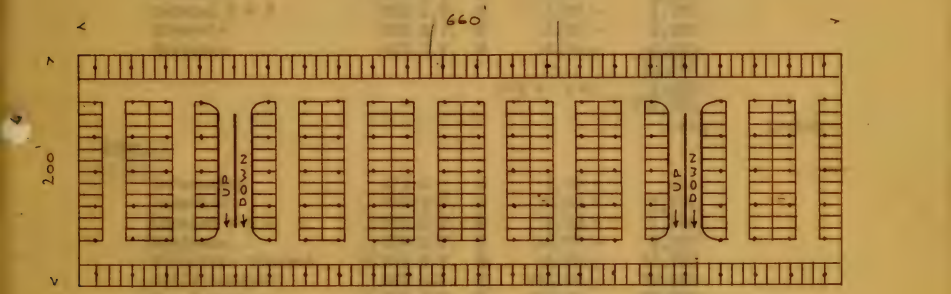
| | | | |
|---|---|---|---|
| Excavation: | 100,630 C.Y. @ $1.00 | = | $100,630 |
| Foundations: | 756,000 S.F. @ $0.25 | = | 189,000 |
| Masonry & Other Trades: | 756,000 S.F. @ $0.21 | = | 164,000 |
| Structure: | 756,000 S.F. @ $6.00 | = | 4,536,000 |
| Plumbing: | 756,000 S.F. @ $0.50 | = | 378,000 |
| Electrical: | 756,000 S.F. @ $0.50 | = | 378,000 |
| Heating & Ventilation: | 264,000 S.F. @ $1.00 | = | 264,000 |
| Sprinklers: | 264,000 S.F. @ $0.50 | = | 132,000 |
| Total | | | $6,141,630 |

Use $6,142,000

$$\frac{\text{Total Cost: } \$6,141,630}{\text{Parking Capacity: } 1,984} = \$3,096/\text{car}$$

$$\frac{\text{Gross Floor Area: } 756,000 \text{ sq.ft.}}{\text{Parking Capacity: } 1,984} = 381 \text{ gross sq.ft./car}$$

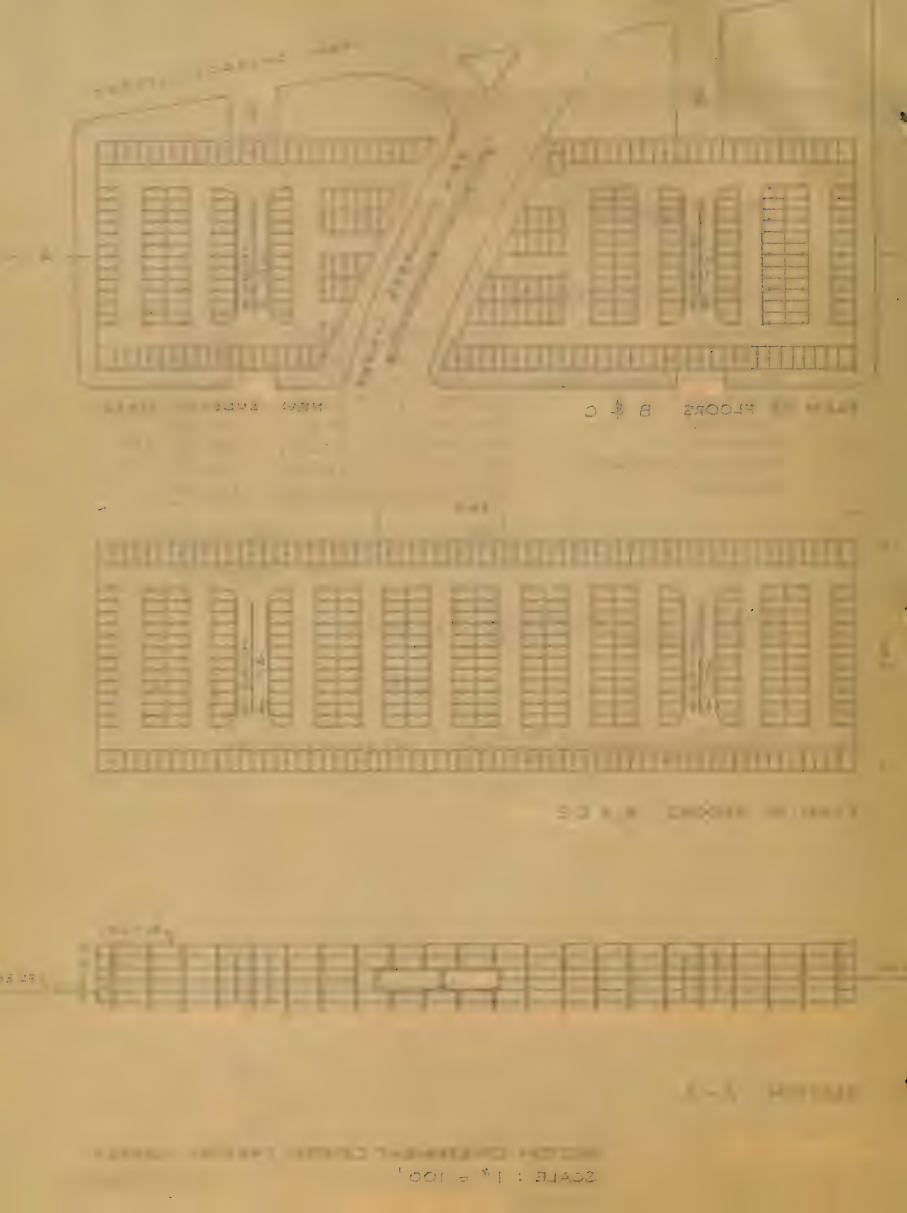

PLAN OF FLOORS B & C




PLAN OF FLOORS A, & D, E


SECTION A – A

BOSTON GOVERNMENT CENTER PARKING GARAGE
SCALE : 1" = 100'



## CENTRAL ARTERY INTERCHANGE ADJUSTMENTS

### Ramp A1

| | | | | | |
|---|---|---|---|---|---|
| Excavation | 650 C.Y. | @ | $ 1.00 = | $ 650 | |
| Pavement | 1,300 S.Y. | @ | 3.50 = | 4,550 | |
| Curbing R & R | 750 L.F. | @ | 2.00 = | 1,500 | |
| Sidewalk | 150 S.Y. | @ | 5.00 = | 750 | |
| Drainage | 430 L.F. | @ | 10.00 = | 4,300 | |
| New Structure | 35,500 S.F. | @ | 20.00 = | 710,000 | |
| | | | | 721,750 | |
| | | | Use: | 722,000 | |
| | | | 10% E. & C. | 72,200 | |
| | | | | $794,200 | |
| | | | | Use: | $795,000 |

### Ramp B

| | | | | | |
|---|---|---|---|---|---|
| Excavation | 575 C.Y. | @ | 1.00 = | 575 | |
| Pavement | 1,150 S.Y. | @ | 3.50 = | 4,025 | |
| Curbing R & R | 850 L.F. | @ | 2.00 = | 1,700 | |
| Sidewalk | 300 S.Y. | @ | 5.00 = | 1,500 | |
| Drainage | 420 L.F. | @ | 10.00 = | 4,200 | |
| | | | | 12,000 | |
| | | | 10% E. & C. | 1,200 | |
| | | | | $13,200 | |
| | | | | Use: | 13,500 |

### Ramp F1

| | | | | | |
|---|---|---|---|---|---|
| Excavation | 475 C.Y. | @ | 1.00 = | 475 | |
| Pavement | 950 S.Y. | @ | 3.50 = | 3,325 | |
| Curbing R & R | 650 L.F. | @ | 2.00 = | 1,300 | |
| Drainage | 320 L.F. | @ | 10.00 = | 3,200 | |
| Structure Removed | 9,240 S.F. | @ | 3.00 = | 27,720 | |
| Walls Removed | 300 L.F. | @ | 132.00 = | 39,600 | |
| *New Structure | 9,240 S.F. | @ | *10.00 = | 92,400 | |
| New Walls | 300 L.F. | @ | 230.00 = | 69,000 | |
| | | | | 237,020 | |
| | | | Use: | 237,000 | |
| | | | 10% E. & C. | 23,700 | |
| | | | | $260,700 | |
| | | | | Use: | 261,000 |

*Some existing structural steel to be re-used.

## CRITICAL ACTIVITY INTERCHANGE ANALYSIS/COST

### Item A1

| | | | | |
|---|---|---|---|---|
| Excavation | 650 C.Y. @ | $ 1.00 = | $ 650 |
| Pavement | 1,500 S.Y. @ | 3.50 = | 4,550 |
| Curbing & R | 750 L.F. @ | 2.00 = | 1,500 |
| Sidewalk | 150 S.Y. @ | 5.00 = | 750 |
| Drainage | 450 L.F. @ | 10.00 = | 4,500 |
| New Structure | 35,500 S.F. @ | 20.00 = | 710,000 |
| | | | 721,750 |
| | Use: | 722,000 | |
| | 10% E. & C. | 72,200 | |
| | | $794,200 | |
| Use: | | | $795,000 |

### Item 2

| | | | |
|---|---|---|---|
| Excavation | 575 C.Y. @ | 1.00 = | 575 |
| Pavement | 1,150 S.Y. @ | 3.50 = | 4,025 |
| Curbing & R | 850 L.F. @ | 2.00 = | 1,700 |
| Sidewalk | 300 S.Y. @ | 5.00 = | 1,500 |
| Drainage | 420 L.F. @ | 10.00 = | 4,200 |
| | | | 12,000 |
| | 10% E. & C. | 1,200 | |
| | | $13,200 | |
| Use: | | | 13,300 |

### Item 71

| | | | |
|---|---|---|---|
| Excavation | 475 C.Y. @ | 1.00 = | 475 |
| Pavement | 950 S.Y. @ | 3.50 = | 3,325 |
| Curbing & R | 650 L.F. @ | 2.00 = | 1,300 |
| Drainage | 320 L.F. @ | 10.00 = | 3,200 |
| Structure Removed | 3,240 S.F. @ | 3.00 = | 27,720 |
| Walls Removed | 300 L.F. @ | 122.00 = | 36,600 |
| *New Structure | 3,240 S.F. @ | *10.00 = | 32,400 |
| New Walls | 300 L.F. @ | 130.00 = | 39,000 |
| | | | 137,020 |
| | Use: | 137,000 | |
| | 10% E. & C. | 23,700 | |
| | | $160,700 | |
| Use: | | | 161,000 |

*Some existing structural steel to be re-used.

Ramp G1

| | | | | |
|---|---|---|---|---|
| Excavation | 1,050 C.Y. | @ | $ 1.00 = | $ 1,050 |
| Pavement | 2,100 S.Y. | @ | 3.50 = | 7,350 |
| Curbing (new) | 1,250 L.F. | @ | 4.00 = | 5,000 |
| Drainage | 630 L.F. | @ | 10.00 = | 6,300 |
| | | | | 19,700 |
| | | | Use | 20,000 |
| | | | 10% E & C | 2,000 |
| | | | | 22,000 |

Use: $22,000

Ramp H1

| | | | | |
|---|---|---|---|---|
| Structure Removed | 11,550 S.F. | @ | 3.00 = | 34,650 |
| Walls Removed | 320 L.F. | @ | 132.00 = | 42,240 |
| * New Structure | 11,550 S.F. | @ | 10.00 = | 115,500 |
| New Walls | 320 L.F. | @ | 230.00 = | 73,600 |
| | | | | 265,990 |
| | | | Use | 266,000 |
| | | | 10% E & C | 26,600 |
| | | | | 292,600 |

Use: $293,000

Ramp J1

| | | | | |
|---|---|---|---|---|
| Excavation | 1,150 C.Y. | @ | 1.00 = | 1,150 |
| Pavement | 2,300 S.Y. | @ | 3.50 = | 8,050 |
| Curbing R & R | 1,150 L.F. | @ | 2.00 = | 2,300 |
| Sidewalk | 200 S.Y. | @ | 5.00 = | 1,000 |
| Drainage | 625 L.F. | @ | 10.00 = | 6,250 |
| | | | | 18,750 |
| | | | Use | 19,000 |
| | | | 10% E & C | 1,900 |
| | | | | 20,900 |

Use: $ 21,000

Ramp K1(Blackstone St.)

| | | | | |
|---|---|---|---|---|
| Pavement | 150 S.Y. | @ | 3.50 = | 525 |
| Excavation | 75 C.Y. | @ | 1.00 = | 75 |
| Curbing R & R | 350 L.F. | @ | 2.00 = | 700 |
| Drainage | 350 L.F. | @ | 10.00 = | 3,500 |
| | | | | 4,800 |
| | | | Use | 5,000 |
| | | | 10% E. & C | 500 |
| | | | | 5,500 |

Use: $ 6,000

* Some existing structural steel to be removed.

Dump #1

| | | | | |
|---|---|---|---|---|
| Excavation | 1,050 C.Y. | @ | $ 1.00 = | $ 1,050 |
| Pavement | 2,100 S.Y. | @ | 3.50 = | 7,350 |
| Curbing (new) | 1,250 L.F. | @ | 4.00 = | 5,000 |
| Drainage | 630 L.F. | @ | 10.00 = | 6,300 |
| | | | | 19,700 |
| | | | Use | 20,000 |
| | | | 10% E & C | 2,000 |
| | | | | 22,000 |

Use: $22,000

Dump #2

| | | | | |
|---|---|---|---|---|
| Structure Removed | 11,550 S.F. | @ | 3.00 = | 34,650 |
| Walls Removed | 320 L.F. | @ | 132.00 = | 42,240 |
| * New Structure | 11,550 S.F. | @ | 10.00 = | 115,500 |
| New Walls | 320 L.F. | @ | 230.00 = | 73,600 |
| | | | | 265,990 |
| | | | Use | 266,000 |
| | | | 10% E & C | 26,600 |
| | | | | 292,600 |

Use: $293,000

Dump #3

| | | | | |
|---|---|---|---|---|
| Excavation | 1,150 C.Y. | @ | 1.00 = | 1,150 |
| Pavement | 2,300 S.Y. | @ | 3.50 = | 8,050 |
| Curbing & S | 1,150 L.F. | @ | 2.00 = | 2,300 |
| Sidewalk | 200 S.Y. | @ | 5.00 = | 1,000 |
| Drainage | 625 L.F. | @ | 10.00 = | 6,250 |
| | | | | 18,750 |
| | | | Use | 19,000 |
| | | | 10% E & C | 1,900 |
| | | | | 20,900 |

Use: $ 21,000

Dump #4(Miscellaneous Et.)

| | | | | |
|---|---|---|---|---|
| Pavement | 150 S.Y. | @ | 3.50 = | 525 |
| Excavation | 75 C.Y. | @ | 1.00 = | 75 |
| Curbing & S | 350 L.F. | @ | 2.00 = | 700 |
| Drainage | 350 L.F. | @ | 10.00 = | 3,500 |
| | | | | 4,800 |
| | | | Use | 5,000 |
| | | | 10% E. & C | 500 |
| | | | | 5,500 |

Use: $ 6,000

* Some existing structural steel to be removed.

R-224 (Special)

Ramp L

| | | | | |
|---|---|---|---|---|
| Structure Removed | 9,900 S.F. | @ | $ 3.00 = | $ 29,700 |
| Walls Removed | 300 L.F. | @ | 132.00 = | 39,600 |
| | | | | 69,300 |
| | | | 10% E & C | 6,930 |
| | | | | 76,230 |

Use: $ 77,000

Ramp M1

| | | | | |
|---|---|---|---|---|
| New Structure | 3,300 S.F. | @ | 20.00 = | 66,000 |
| Walls Removed | 100 L.F. | @ | 132.00 = | 13,200 |
| | | | | 79,200 |
| | | | 10% E & C | 7,920 |
| | | | | 87,120 |

Use: $ 88,000

Ramp N1

| | | | | |
|---|---|---|---|---|
| New Structure | 10,230 S.F. | @ | 20.00 = | 204,600 |
| Walls Removed | 270 L.F. | @ | 132.00 = | 35,640 |
| | | | | 240,240 |
| | | | Use | 241,000 |
| | | | 10% E & C | 24,100 |
| | | | | 265,100 |

Use: $ 266,000

Ramp O1

Widen Existing Structure

| | | | | |
|---|---|---|---|---|
| | 13,050 S.F. | @ | 20.00 = | 261,000 |
| | | | 10% E & C | 26,100 |
| | | | | 287,100 |

Use: $ 288,000

Ramp L

| | | | | |
|---|---|---|---|---|
| Structure Removed | 9,900 S.F. | @ | $ 3.00 = | $ 29,700 |
| Walls Removed | 300 L.F. | @ | 132.00 = | 39,600 |
| | | | | 69,300 |
| | | | 10% E & C | 6,930 |
| | | | | 76,230 |

Use: $ 77,000

Ramp M1

| | | | | |
|---|---|---|---|---|
| New Structure | 3,300 S.F. | @ | 20.00 = | 66,000 |
| Walls Removed | 100 L.F. | @ | 132.00 = | 13,200 |
| | | | | 79,200 |
| | | | 10% E & C | 7,920 |
| | | | | 87,120 |

Use: $ 88,000

Ramp N1

| | | | | |
|---|---|---|---|---|
| New Structure | 10,230 S.F. | @ | 20.00 = | 204,600 |
| Walls Removed | 270 L.F. | @ | 132.00 = | 35,640 |
| | | | | 240,240 |
| | | | Use | 241,000 |
| | | | 10% E & C | 24,100 |
| | | | | 265,100 |

Use: $ 266,000

Ramp O1

Widen Existing Structure

| | | | | |
|---|---|---|---|---|
| | 13,050 S.F. | @ | 20.00 = | 261,000 |
| | | | 10% E & C | 26,100 |
| | | | | 287,100 |

Use: $ 288,000

Roadway Approaches to Tunnel

| | | | | | |
|---|---|---|---|---|---|
| Excavation | 600 C.Y. | @ $ | 1.00 = | $ 600 | |
| Pavement | 1,200 S.Y. | @ | 3.50 = | 4,200 | |
| Curbing R & R | 500 L.F. | @ | 2.00 = | 1,000 | |
| Curbing (new) | 1,000 L.F. | @ | 4.00 = | 4,000 | |
| Sidewalks | 700 S.Y. | @ | 5.00 = | 3,500 | |
| Drainage | 1 L.S. | | | 5,000 | |
| | | | | 18,300 | |
| | | | Use | 18,500 | |
| | | | 10% E & C | 1,850 | |
| | | | | 20,350 | |
| | | | | Use: | $ 20,500 |

Washington St. South

| | | | | | |
|---|---|---|---|---|---|
| Excavation | 675 C.Y. | @ | 1.00 = | 675 | |
| Pavement | 1,350 S.Y. | @ | 3.50 = | 4,725 | |
| Curbing R & R | 600 L.F. | @ | 2.00 = | 1,200 | |
| Drainage | 400 L.F. | @ | 10.00 = | 4,000 | |
| | | | | 10,600 | |
| | | | Use | 11,000 | |
| | | | 10% E & C | 1,100 | |
| | | | | 12,100 | |
| | | | | Use: | 12,000 |

Artery Down Ramp to Chardon St.

| | | | | | |
|---|---|---|---|---|---|
| Excavation | 400 C.Y. | @ | 1.00 = | 400 | |
| Pavement | 800 S.Y. | @ | 3.50 = | 2,800 | |
| Curbing R & R | 400 L.F. | @ | 2.00 = | 800 | |
| Drainage | 240 L.F. | @ | 10.00 = | 2,400 | |
| | | | | 6,400 | |
| | | | Use | 6,500 | |
| | | | 10% E & C | 650 | |
| | | | | 7,150 | |
| | | | | Use: | 7,500 |

Lighting and Signs

| | | |
|---|---|---|
| | 100,000 | |
| 10% E & C | 10,000 | |
| | 110,000 | |
| | Use: | 110,000 |

| | | |
|---|---|---|
| GRAND TOTAL | 2,375,500 | |
| USE: | | 2,375,000 |

R-224 (Special)

Roadway Improvements to Tunnel

| | | | | |
|---|---|---|---|---|
| Excavation | 600 C.Y. | @ | $ 1.00 = | $ 600 |
| Pavement | 1,200 S.Y. | @ | 3.50 = | 4,200 |
| Curbing R & R | 500 L.F. | @ | 2.00 = | 1,000 |
| Curbing (new) | 1,000 L.F. | @ | 4.00 = | 4,000 |
| Sidewalks | 700 S.Y. | @ | 5.00 = | 3,500 |
| Drainage | 1 L.S. | | | 5,000 |
| | | | | 18,300 |
| | | | Use | 18,300 |
| | | | 10% E & C | 1,830 |
| | | | | 20,130 |
| | | | Use: | $ 20,300 |

Washington St. South

| | | | | |
|---|---|---|---|---|
| Excavation | 675 C.Y. | @ | 1.00 = | 675 |
| Pavement | 1,350 S.Y. | @ | 3.50 = | 4,725 |
| Curbing R & R | 600 L.F. | @ | 2.00 = | 1,200 |
| Drainage | 400 L.F. | @ | 10.00 = | 4,000 |
| | | | | 10,600 |
| | | | Use | 11,000 |
| | | | 10% E & C | 1,100 |
| | | | | 12,100 |
| | | | Use: | 12,000 |

Arbery Ave. Ramp to Charles St.

| | | | | |
|---|---|---|---|---|
| Excavation | 400 C.Y. | @ | 1.00 = | 400 |
| Pavement | 800 S.Y. | @ | 3.50 = | 2,800 |
| Curbing R & R | 400 L.F. | @ | 2.00 = | 800 |
| Drainage | 240 L.F. | @ | 10.00 = | 2,400 |
| | | | | 6,400 |
| | | | Use | 6,500 |
| | | | 10% E & C | 650 |
| | | | | 7,150 |
| | | | Use: | 7,500 |

Lighting and Signs

| | |
|---|---|
| | 100,000 |
| 10% E & C | 10,000 |
| | 110,000 |
| Use: | 110,000 |

GRAND TOTAL 2,375,500

USE: 2,375,000

CENTRAL ARTERY INTERCHANGE ADJUSTMENTS - INTERIM COSTS

| | | | |
|---|---|---|---|
| 250 C.Y. | Excavation | @ $1.00 | $ 250.00 |
| 500 S.Y. | Pavement | @ $3.50 | $1,750.00 |
| 800 L.F. | Curbing R & R | @ $2.00 | $1,600.00 |
| 300 S.Y. | Sidewalks | @ $5.00 | $1,500.00 |
| | | | $5,100.00 |
| | | 10% E.& C. | 500.00 |
| | | | $5,600.00 |

Use: $6,000.00

CENTRAL ARMORY INTERCHANGE ADJUSTMENTS - INTERIM COSTS

| | | | |
|---|---|---|---|
| 250 C.Y. | Excavation | @ $1.00 | $ 250.00 |
| 500 S.Y. | Revement | @ $3.50 | $1,750.00 |
| 500 L.F. | Curbing A & B | @ $2.00 | $1,000.00 |
| 300 S.Y. | Sidewalks | @ $5.00 | $1,500.00 |
| | | | $5,100.00 |
| | 10% E.& C. | | 500.00 |
| | | | $5,600.00 |

Use: $6,000.00

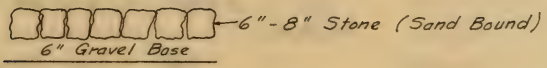
B-426 (Special)

COMP. BY_____
CHECK BY_____
ACTIV. NO._____

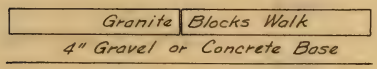
CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET_____OF_____
DATE 6-29-61
LOCATION_____

SUBJECT




Typical Cobble Stone Section



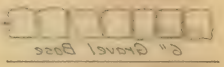

Typical Sidewalk Section

Precast Conc. Block around trees to be 4" thick.

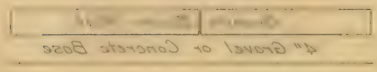
Trees to be 6"-8" in diameter.

Lawn areas to have 4" loam.

Tree price of $500.00 each includes planting, loaming, and tieing down trees and setting decorative block around tree.




Typical Cobble Stone Section




Typical Sidewalk Section

Precast Conc. Block around trees to be 4" thick.

Trees to be 8"-12" diameter.

Lawn areas to have 4" loam.

Tree price of $500.00 each includes planting, loaming, and fixing down trees and setting decorative block around tree.

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE
LOCATION

SUBJECT Underpass (New Congress Street)

Excavation

| Sta. | | | Ave. |
|---|---|---|---|
| 0+00 | 90' × 1.5' = | 135 S.F. | |
| | | | 148 S.F. |
| 1+00 | 80' × 2.0' = | 160 | |
| | | | 325 |
| 2+00 | 70' × 7.0' = | 490 | |
| | | | 405 |
| 3+00 | 64' × 5.0' = | 320 | |
| | | | 288 |
| 4+00 | 64' × 4.0' = | 256 | |
| | | | 224 |
| 5+00 | 64' × 3.0' = | 192 | |
| | | | 156 |
| 6+00 | 80' × 1.5' = | 120 | |
| | | | 120 |
| 7+00 | 80' × 1.5' = | 120 | |

1,666 S.F × 100' × $\frac{1}{27}$ = 6,170 C.Y.

Say 6,200 C.Y.

Drainage (See Sketch)

| | |
|---|---|
| Catch Basins | 11 Each |
| Manholes | 6 Each |
| 12" Reinf. Conc. Pipe | 400 L.F. |
| 15" " " " | 450 L.F. |

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET OF
DATE 6-29-61
LOCATION

SUBJECT Under 2000 (New Concrete Street)

Lighting (See Sketch)

| | | |
|---|---|---|
| 100w Rapid Start Flourescent Units with Ballast | | 56 Each |
| 100w Rapid Start Flourescent Units no Ballast | | 56 Each |
| #6 - 1/c Cable | | 2600 L.F. |
| 1½" Conduit | | 50 L.F. |
| 2" Conduit | | 150 L.F. |
| Junction Boxes | | 2 Each |
| Manhole | (Use ½ for cost) | ½ Each |

COMP. BY: CM

CHECK BY:

ACTIV. NO.:

**CLARKESON ENGINEERING CO., INC.**

ENGINEERS

SHEET ____ OF ____

DATE: [illegible]

LOCATION:

SUBJECT: Underpass (Main Contract Sheet)

Retaining Walls 520 Feet

Footing Concrete 1.5 × 6 × 1/27 = 0.33 cy × 620 = 207

Stem Concrete 1.5 × 7.5 × 1/27 = 0.42 cy × 620 = 270

477

Reinforcing 477 × 150#/cu = 71500#

Excavation 8 × 8 × 620/27 = 1470 c.y.

COMP. BY: EM
CHECK BY:
ACTIV. NO.: 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE: 6-28-61
LOCATION:

SUBJECT

PEDESTRIAN OVERPASS (CITY HALL)

Quantities:

| | | | |
|---|---|---|---|
| Concrete Slab | $(120 \times 280 \times \frac{6}{12} + 80 \times 100 \times \frac{6}{12}) \frac{1}{27}$ | = | 770 c.y. |
| Membrane | $(120 \times 280 + 80 \times 100)\ 1/9$ | = | [illegible] |
| 2" Protection | $770 \times \frac{2}{6}$ | = | 256 c.y. |
| Railing | $120 + 280 + 200 + 100$ | = | 700 Lin. Ft. |
| Structural Steel | $(56 \times 120 + 16 \times 100)\ 116 \times 1.20$ | = | 1,158,120 Lbs. |
| Reinforcing Steel | $6.32\ \#/\phi \times 41600\ \phi$ | = | 263,000 Lbs |

SUBSTRUCTURE

| | | | |
|---|---|---|---|
| Footing Column Concrete | 35 × 4 cy = | 170 c.y. | = |
| Footing Wall Concrete | 340' × 1 c.y. = | 340 c.y | 510 c.y |
| Wall Stem Concrete | 340' × 2 c.y. = | 680 cy | |
| Column Concrete | 35 × 6 c.y = | 210 c.y | |
| Cap Concrete | 780 Lin Ft × 1/3 c.y. = | 260 c.y | 1150 c.y. |
| Reinforcing Steel | 150 #/cy × 1660 = | | 248 000 # |
| Excavation: Cols | 35 × 4' × 8' × 8' × 1/27 = | 332 cy | |
| Wall | 340' × 4' × 11.5 × 1/27 = | 580 c.y. | |
| | | 912 | 1000 c.y |
| Stair Concrete | | | 150 c. |
| Reinforcing Steel | | | 5000 # |

COMP. BY J. P. W.
CHECK BY
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE [illegible]
LOCATION

SUBJECT Government Center Common

Embankment

| Sta. | P.E. | Ave. P.E. |
|---|---|---|
| 0+00 | 10.00 | |
| | | 8.86 |
| 1+00 | 7.72 | |
| | | 7.75 |
| 2+00 | 7.78 | |
| | | 7.44 |
| 3+00 | 7.10 | |
| | | 5.89 |
| 4+00 | 4.68 | |
| | | 3.88 |
| 5+00 | 3.08 | |

$33.82 \times 100 \times 250 \times \frac{1}{27} = 31{,}315$ C.Y.
$180 \times 115 \times 8 \times 1/27 = 6{,}133$
$200 \times 60 \times 3 \times 1/27 = 1{,}333$
38,781
+20% 7,756
46,537 C.Y.

Say 46,500 C.Y.

Embankment over [illegible] Exit

$300' \times 270' \times 3' \times \frac{1}{27} = 9{,}000$ C.Y.
+20% 1,800
10,800 C.Y.

Say 10,800 C.Y.

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 121

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ___ OF ___
DATE 6-29-61
LOCATION

SUBJECT Government Center Common

Cobblestone Paving

Surface Area

| | | |
|---|---|---|
| $125 \times 310 \times \frac{1}{2}$ | = | 19,375 S.F. |
| $80 \times 170 \times \frac{1}{2}$ | = | 6,800 |
| $42 \times 100 \times \frac{1}{2}$ | = | 2,100 |
| $70 \times 180 \times \frac{1}{2}$ | = | 6,300 |
| [illegible] | = | [illegible] |
| $70 \times 140 \times \frac{1}{2}$ | = | 4,900 |
| $80 \times 90 \times \frac{1}{2}$ | = | 3,600 |
| $60 \times 125 \times \frac{1}{2}$ | = | 3,750 |
| $15 \times 65 \times \frac{1}{2}$ | = | 488 |
| $80 \times 235 \times \frac{1}{2}$ | = | 9,400 |
| $150 \times 230 \times \frac{1}{2}$ | = | 17,250 |
| $95 \times 165 \times \frac{1}{2}$ | = | 7,838 |
| $115 \times 330 \times \frac{1}{2}$ | = | 18,975 |
| $48 \times 340$ | = | 16,320 |
| $19 \times 350 \times \frac{1}{2}$ | = | 3,325 |
| $20 \times 40 \times \frac{1}{2}$ | = | 400 |
| $25 \times 25$ | = | 625 |
| $20 \times 60 \times \frac{1}{2}$ | = | 600 |
| $103 \times 185 \times \frac{1}{2}$ | = | 9,528 |
| $7 \times 25 \times \frac{1}{2}$ | = | 88 |
| $30 \times 130 \times \frac{1}{2}$ | = | 1,950 |
| $65 \times \frac{70+120}{2}$ | = | 6,175 |
| $20 \times 90$ | = | 1,800 |
| [illegible] | = | [illegible] |
| $65 \times 175$ | = | [illegible] |
| $40 \times 175 \times \frac{1}{2}$ | = | 3,500 |
| $85 \times \frac{10+25}{2}$ | = | 1,488 |
| $175 \times \frac{[illegible]}{2}$ | = | [illegible] |
| | | 181,625 S.F. $\times \frac{1}{9}$ = 20,180 S.Y. |

Say 20,500 S.Y.

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 121

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE 2-3-61
LOCATION

SUBJECT Government Center Common

Granite Block Walks

Surface Area

230' x 10'
230
260
170
230
340
340
190
120
220
710
400
150
3640' x 10 = 36,400 S.F.

530' x 15' = 7,800 S.F.

530' x 20
170
200
90
1620' x 20' = 32,400

60' x 140' = 8,400

36,400
85,000 S.F. x 1/9 = 9,444 S.Y.

Say 9,500 S.Y.

Trees and Setting

85 Trees

Say 55 Each

Loaming and Seeding

3.1416 x 140 x 140 = 61,575 x 1/9 = 6,850 S.Y.

Say 6,900 S.Y.

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 131

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE
LOCATION

SUBJECT Government Center Common

Lighting (See Sketch )

| | |
|---|---|
| Single Unit Standards | 42 Each |
| Multiple Unit Standards | 2 Each |
| #4 2/c Cable | 3800 L.F. |
| #6 2/c Cable | 2000 L.F. |
| Trench | 6000 L.F. |
| Photo Cells | 7 Each |
| Relays | 7 Each |
| Junction Boxes | 2 Each |
| Distribution Manhole | 1 Each |

Drainage

| | |
|---|---|
| 12" Reinf. Conc. Pipe | 1650 L.F. |
| 15" " " " | 150 L.F. |
| 18" " " " | 625 L.F. |
| 24" " " " | 450 L.F. |
| Inlets | 40 Each |
| Manholes | 10 Each |
| 10" Sub-drain | 1100 L.F. |
| Grating | 900 L.F. |

SUBTRACT

YOUR NO.

CHECK BY

LOAN NO.

CUMBERSON ENGINEERING CO., INC.

PROJECT

DATE

SHEET

COMP. BY: $M
CHECK BY:
ACTIV. NO.:

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE: 6-28-61
LOCATION:

SUBJECT: GOVERNMENT CENTER COMM.

RETAINING WALL 1210 Feet Long

Footing Concrete $8 \times 2 \times 1/27 \times 1210 = 720$ c.y

Stem Concrete $1.75 \times 13 \times 1/27 \times 1210 = 1020$ c.y

Reinforcing $150\#/cy \times 1740 = 261000\#$

Excavation.
$6 \times 240 \times 10 = 14450$
$4 \times 200 \times 10 = 8000$
$5.5 \times 270 \times 10 = 14850$
$4 \times 250 \times 10 = 10000$
[illegible]
[illegible] = [illegible]

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE 6-29-61
LOCATION

SUBJECT Dock Square Plaza Area

Cobblestone Paving

Surface Area

| | | |
|---|---|---|
| 55 × 183 | = | 10,065 |
| 51 × 165 | = | 8,415 |
| 46 × 133 | = | 6,118 |
| 62 × 192 | = | 11,904 |
| 47 × 166 | = | 7,802 |
| 72 × 170 − 1521 | = | 10,719 |
| 35 × 135 × ½ | = | 2,363 |
| | | 57,386 S.F. × 1/9 = 6,376 S.Y. |

Say 6,500 S.Y.

Granite Block Walks

Surface Area

| | | |
|---|---|---|
| 320 × 10 | = | 3,200 |
| 70 × 10 | = | 700 |
| 350 × 10 | = | 3,500 |
| 100 × 35 | = | 3,500 |
| 90 × 20 | = | 1,800 |
| | | 12,700 S.F. × 1/9 = 1,400 S.Y. |

Say 1,400 S.Y.

Trees and Setting

30 Trees

Say 30 Each

SHEET ____ OF ____
DATE ____
LOCATION ____

CLARKSON ENGINEERING CO., INC.
CHICAGO

COMP. BY ____
CHECK BY ____
ACCT. NO. ____

SUBJECT ____

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE
LOCATION

SUBJECT Dock Square Plaza Area

Lighting

| Circuit No. | Standards | Cable #4 | Cable #6 | Trench | Photo Cells | Relay | Dist. M.H. | |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 | | 450 | 450 | 1 | 1 | 1 | |
| 2 | 5 | | 550 | 550 | 1 | 1 | | |
| 3 | 5 | | 480 | 480 | 1 | 1 | | |
| Total | 15 | | 1480 | 1480 | 3 | 3 | 1 | |

| | |
|---|---|
| Single Unit Standards | 15 Each |
| #6-3/c Cable | 1500 L.F. |
| Trench | 1500 L.F. |
| Photo Cells | 3 Each |
| Relays | 3 Each |
| Manhole (Use ½ for cost) | ½ Each |

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ___ OF ___
DATE
LOCATION

SUBJECT Pemberton Square Grading

**Excavation**

| Sta. | P.R. | Ave. P.R. |
|---|---|---|
| 0+00 | 0.00 | |
| | | 0.61 |
| 1+00 | 1.22 | |
| | | 1.47 |
| 2+00 | 1.72 | |
| | | 1.03 |
| 3+00 | 0.34 | |
| 4+00 | | |
| 5+00 | | |
| 6+00 | | |
| | | 3.11 |

$3.11 \times 100 \times 250 \times \frac{1}{27} = 2{,}880$ C.Y.

**Embankment**

| Sta. | P.R. | Ave. P.R. |
|---|---|---|
| 0+00 | 0.00 | |
| | | 0.36 |
| 1+00 | 0.72 | |
| | | 0.87 |
| 2+00 | 1.02 | |
| | | 1.25 |
| 3+00 | 1.48 | |
| | | 1.25 |
| 4+00 | 1.02 | |
| | | 1.80 |
| 5+00 | 2.58 | |
| | | 2.30 |
| 6+00 | 2.02 | |
| | | 7.83 |

$7.83 \times 100 \times 250 \times \frac{1}{27} = 7{,}250$ C.Y.
$- \ 2{,}880$
$4{,}370$
$+20\% \ \ 874$
$5{,}244$ C.Y.

Excavation Say 2,900 C.Y.

Embankment Say 5,200 C.Y.

COMP. BY _____ CHECK BY _____ ACTIV. NO. _____

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET _____ OF _____
DATE [illegible]
LOCATION _____

SUBJECT PEMBERTON SQUARE GRADING

RETAINING WALL AT PEMBERTON SQUARE

Length of wall = 360 feet

Average height of wall = 21.67'

Quantities:

Footing Concrete $2.5 \times 11/27$ = 1.02 cy/LF

Concrete Above Footing $\frac{1.5+2.5}{2} \times \frac{18.5}{27}$ = 1.36 cy/LF

2.38 cy/LF

Total Concrete 2.38 × 360 = 856 cy (900 cy)

Reinforcing Steel 150#/c.y. × 900 = 135000 lbs

Excavation $18 \times 9 \times 360/27$ = 1560 cy (1600 cy)

COMP. BY J.P.W.
CHECK BY
ACTIV. NO. 181.024

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET 1 OF
DATE 4/26/16
LOCATION

SUBJECT Central Artery - Surface Restoration

A1

Surface Area.

30' x 210' = 6300
20' x 110' = 2200
30' x 110' = 3300
430 11,800' x 1/9 = 1,311 S.Y. Say 1,300 S.Y.
Excavation 577 C.Y.

Curbing R+R

2 x 210' = 410.
2 x 110' = 220.
110
740 L.F. Say 750 L.F.

Sidewalk

6' x 210' = 1260 x 1/9 = 140 S.Y. Say 150 S.Y.

B

Surface Area.

30' x 190' = 5700.
20' x 90' = 1800.
20' x 140 = 2800.
10,300 1/9 = 1,144 S.Y. Say 1,150 S.Y.
Excavation 575 C.Y.

Curbing R+R

540'
310'
150
840 L.F. Say 850 L.F.

Sidewalk

150'
310
460' x 6' x 1/9 = 307 S.Y. Say 300 S.Y.

COMP. BY J.P.W.
CHECK BY JLW
ACTIV. NO. 181.024

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ___ OF ___
DATE 6/26/61
LOCATION

SUBJECT Central Artery - Surface Roadways

F1.

Surface Area

30' x 210' = 6300'
20' x 110 = 2200.
320
8500' x 1/9 = 944 S.Y. Say 950 S.Y.
Excavation 1,250 C.Y.

Curbing R+R

190'
170'
270'
630 L.F. Say 650 L.F.

G1

Surface Area

30' x 630' = 18,900' x 1/9 = 2,100 S.Y. Say 2,100 S.Y.
Excavation 1,050 C.Y.

Curbing (New)

2 x 630' = 1260 L.F. Say 1250 L.F.

J1

Surface Area

33' x 625' = 20,625 x 1/9 = 2,292 S.Y. Say 2,300 S.Y.
Excavation 1,150 C.Y.

Curbing R+R

500
200
450
1150 L.F. Say 1,150 L.F.

Sidewalk

6' x 270' x 1/9 = 180 S.Y. Say 200 S.Y.

COMP. BY L.P.W. | CLARKESON ENGINEERING CO., INC. | SHEET 2 OF
CHECK BY J.W. | ENGINEERS | DATE 4/20/61
ACTIV. NO. 181.623 | | LOCATION

SUBJECT Central Artery - Surface Roadways

Blackstone St.

Surface Area. (None - use existing Roadway)
(Patch at Curbing)

Say 150 S.Y.

Excavation 75 C.Y.

Curbing R+R

350 L.F. Say 350 L.F.

Roadway Approaches to Tunnel

Surface Area.

25' × 250' = 6,250
20' × 100 = 2,000
8250 × 1/9 = 916 S.Y.
Patching. 284 S.Y.
1200 Say 1200 S.Y.

Excavation 600 C.Y

Curbing 200'
160'
200'
200'
300'
300'
1360 L.F.

Say 500 L.F. R+R
Say 1000 L.F. New

Sidewalk.

6' × 300' × 1/9 = 200 S.Y.

Islands

10 × 80 = 800
10 × 90 = 900
10 × 150 = 1500
15 × 70 = 1050
4250 × 1/9 = 472
200
672 Say 700 S.Y.

COMP. BY
CHECK BY
ACTIV. NO.
SUBJECT

CLARKSON ENGINEERING CO., INC.

SHEET NO.
DATE
LOCATION

COMP. BY J.P.W.
CHECK BY [illegible]
ACTIV. NO. 181.024

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET [illegible] OF [illegible]
DATE [illegible]
LOCATION

SUBJECT Central Artery - Surface Roadways

Washington St. South.

Surface Area.

30' x 400' x 1/9 = 1,333 S.Y. Say 1,350 S.Y.
Excavation

Curbing R+R
80'
240'
60'
130'
80'
590' L.F. Say 600 L.F.

Artery - Down Ramp to Chardon St.

Surface Area.

30' x 240' x 1/9 = 800 S.Y. Say 800 S.Y.
Excavation

Curbing Say 480 L.F.

COMP. BY: J.M.
CHECK BY:
ACTIV. NO.: 181

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ___ OF ___
DATE: 6-28-61
LOCATION:

SUBJECT

Use average 100' span for deck

| | | | |
|---|---|---|---|
| Deck Concrete | $28 \times 100 \times 9/12 \times \frac{1}{27}$ | = 78 c.y. | 0.78 c.y |
| Bituminous Surfacing | $\frac{2.5}{12} \times 28 \times 100 \times 160 \times \frac{1}{2000}$ | = 46.5 Tons | 0.47 Tons |
| Membrane Waterproofing | $28 \times 100 \times 1/9$ | = 311 s.y. | 3.11 s.y |
| Reinforcing Steel | $7\#/\square \times 28 \times 100$ | = 19600# | 196# |

Structural Steel

| | | | |
|---|---|---|---|
| 2 Girders PL | 2-18" x 3/4" x 59' | 1 x 59 x 46 x 2 = | 10800 |
| PL | 1-18 x 3/4 x 100 | 1 x 100 x 46 x 2 = | 9200 |
| PL | 1-18 x 3/4 x 77 | 1 x 77 x 46 x 2 = | 7100 |
| web | 84 x 1/2" x 100 | 1 x 100 x 143 x 2 = | 28600 |
| ∠s | 4 - 8 x 8 x 3/4" | 4 x 100 x 38.9 x 2 = | 31100 |
| 5 Floor Beams | 36 WF 194 x 32 lg. | 5 x 194 x 32 = | 31000 |
| 2 Stringers | 27 WF 102 x 100' lg | 2 x 102 x 100 = | 20400 |
| 50 Crossbeams | 16 WF 36 x 44' lg. | 50 x 36 x 44 = | 79000 |
| | | | 217,200# |
| Stiffeners, Connections, Railing, Curbing | 25% | | 54500 |
| | | | 271,700# |

2717#

Substructure

| | | | |
|---|---|---|---|
| Crossbeam | 4 ∠s 6 x 6 x 5/8 | 4 x 24 x 30 = | 2880 |
| | Web 84 x 7/16 | 125 x 30 = | 3750 |
| 2 Columns | 2 - 14 WF 142 | 2 x 142 x 16 x 2 = | 9160 |
| | | | 15,790#/bent |

157.3#

Concrete Footing $[2 \times \overset{1440}{10 \times 12 \times 6} + \overset{600}{5 \times 20 \times 6}] \frac{1}{27}$ = 7.6 c.y./bent — 0.076 c.y

Reinforcing 200#/c.y. x 7.6 = 1520#/Bent — 15.2#

14 BP 89# Piles 14 x 89 x 60' = 75,000#/bent — 750#

COMP. BY EM
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ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE
LOCATION

SUBJECT

Cost of Structure per running foot

| | | | | |
|---|---|---|---|---|
| Deck Concrete | 0.78 c.y | @ 60.00 | = | 46.80 |
| Bituminous Concrete | 0.47 Tons | @ 7.00 | = | 3.29 |
| Membrane | 3.11 s.y. | @ 2.50 | = | 7.78 |
| Reinforcing Steel | 196 # | @ 0.13 | = | 25.48 |
| Structural Steel | 2874.3 # | @ 0.17 | = | 488.63 |
| Footing Concrete | 0.076 c.y. | @ 25.00 | = | 1.90 |
| Footing Reinforcing | 15.2 # | @ 0.13 | = | 1.98 |
| Steel Piles | 750 # | @ 0.14 | = | 105.00 |
| | | | | $680.86 / Running ft. |

Out to out of deck 34'

Cost per square foot = 680.86/34 = 20.00/#

SUBJECT

SCALE: NO

CHECK BY

CONN. BY

DRAWING

CH HADDON ENGINEERING CO., INC.

DATE

DATE

COMP. BY: S M
CHECK BY:
ACTIV. NO.:

**CLARKESON ENGINEERING CO., INC.**
ENGINEERS

SHEET ____ OF ____
DATE: [illegible]
LOCATION:

SUBJECT

Removal of Approach Sections

Concrete 3.2 c.y./Lin. Ft. @ 25 = 80
R & R Gravel 13 c.y./Lin. Ft. @ 3 = 39
119 x 1.10 = 132

Build new walls

Concrete 3.2 c.y./Lin. Ft. @ 60 = 192

Exc. & piles 20% = 38
230

COMP. BY P.W.
CHECK BY
ACTIV. NO. 181

CLARKESON ENGINEERING CO., INC.
ENGINEERS

SHEET ____ OF ____
DATE 6-29-61
LOCATION

SUBJECT Central Artery Interchange Adjustments - Interim Costs

Roadway Changes - Interim

Surface Area

20 x 80 x ½ = 800 S.F.
10 x 20 = 200
25 x 70 = 1750
10 x 150 = 1500
4,250 S.F. x ⅓ = 472 S.Y.

Say 500 S.Y.

Excavation

1.5' x 500 S.Y. x ⅓ = 250 C.Y.

Say 250 C.Y.

Curbing 2+E

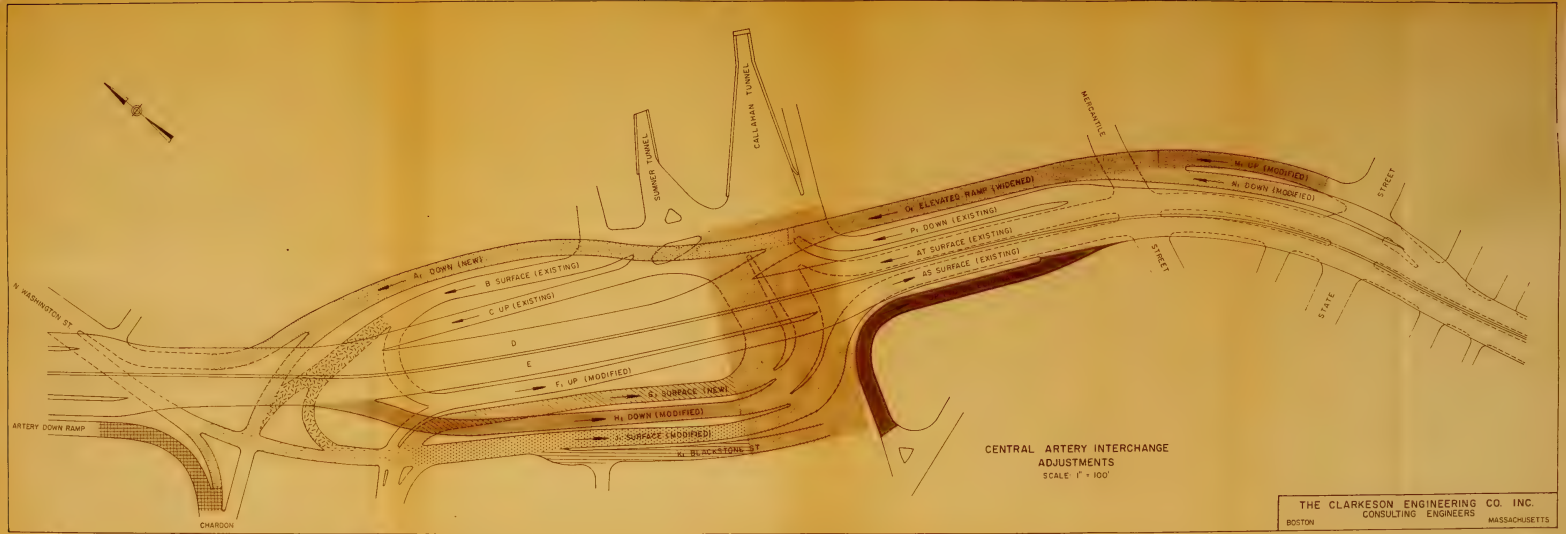
180
250
150
250
730 L.F.

Say 800 L.F.

Sidewalk

5' x 450' x ⅓ = 300 S.Y.

Say 300 S.Y.


N WASHINGTON ST
ARTERY DOWN RAMP
CHARDON
A1 DOWN (NEW)
B SURFACE (EXISTING)
C UP (EXISTING)
D
E
F1 UP (MODIFIED)
G1 SURFACE (NEW)
H1 DOWN (MODIFIED)
J1 SURFACE (MODIFIED)
K1 BLACKSTONE ST
SUMNER TUNNEL
CALLAHAN TUNNEL
O1 ELEVATED RAMP (WIDENED)
P1 DOWN (EXISTING)
AT SURFACE (EXISTING)
AS SURFACE (EXISTING)
M1 UP (MODIFIED)
N1 DOWN (MODIFIED)
MERCANTILE
STREET
STREET
STATE
CENTRAL ARTERY INTERCHANGE
ADJUSTMENTS
SCALE: 1" = 100'
THE CLARKESON ENGINEERING CO. INC.
CONSULTING ENGINEERS
BOSTON
MASSACHUSETTS